THE Soybean Digest

OFFICIAL PUBLICATION • AMERICAN SOYBEAN ASSOCIATION

Harvesting soybeans in Florida

OCTOBER • 1956

VOLUME 16 • NUMBER 12

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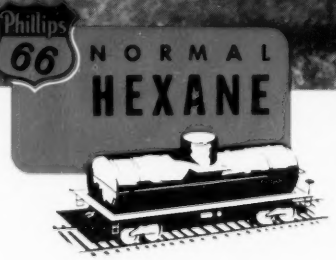

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Bartlesville, Oklahoma

THE Soybean Digest

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HUDSON, IOWA

Vol. 16 • October, 1956 • No. 12

IN THIS ISSUE

THE SOYBEAN DIGEST

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Business, publication and circulation, Hudson, Iowa.
Advertising, Ewing Hutchison Co., 35 E. Wacker Drive, Chicago 1, Ill.

Published on the 10th of each month at Hudson, Iowa, by the American Soybean Association. Entered as second class matter Nov. 20, 1940, at the post office at Hudson, Iowa, under the Act of Mar. 3, 1879.

Forms close on 25th of month preceding.

Subscription rates—to association members, $2.50 per year; to non-members, $3 per year; Canada and other members of the Pan-American Union, $3.50; other foreign, $4. Single copies 30c.

Irrigating Soybeans

Summary of reports from several different states; given before the advisory board of the National Soybean Crop Improvement Council and the American Soybean Association convention

General Conclusions

Soybeans respond less to irrigation than competing crops such as corn or cotton. They are more drouth resistant than these crops.

Soybeans are able to withstand relatively severe drouths during their early stages of growth. Moisture in rather liberal supply is important in the July-August period.

Soybeans may fit into a corn, cotton, alfalfa irrigating system to give a fuller use of equipment, or justify using a larger, more efficient system than otherwise would be practical.

For maximum yields under irrigation, narrow row spacings, good stands, adequate fertility, timely applications, good cultural practices, the best variety and a relatively high level of available water throughout the growing season are essential.

Central Nebraska tests show that maximum increase in yield per unit of water applied, after starting with a root zone filled to field capacity at the start, was from a single irrigation applied when the plants were approaching full bloom.

The results presented so far on the irrigating of soybeans by the various states may serve as a guide for some irrigation practices, but they mainly serve to emphasize the need for much additional information. The range in consumptive use from one year to another should be known. The relationships of fertilizer and water use to yield and seed composition need further study. Differences in varietal responses to irrigation must be studied. Methods of conserving rainfall need more investigation.

The problem that is perhaps most important is the apparent ceiling on yields. In all irrigated tests in Nebraska to date, only once have yields above 50 bushels been obtained. Varieties need to be developed that will respond to irrigation. Then with more information on the requirements of the crop, with proper application of fertilizer and water as needed, and with improved cultural practices to supplement the irrigation of soybeans, yields of 60 to 70 bushels should be attained.

By J. W. CALLAND

IN RECENT years there has been a marked increase in the use of supplemental irrigation on farms in the principal soybean states. This is the use of irrigation during dry spells or to fill in between rains. Most of this supplemental irrigation has been on crops other than soybeans. However, the interest in irrigating soybeans has greatly increased in the past 8 to 10 years.

Experimental data on the results of irrigating soybeans is being collected in several states, mainly in Nebraska, Arkansas, Missouri, Mississippi, South Dakota, and some of the Southwestern States. But, it is quite apparent that much more information is needed to determine the relationship between the soybean crop and water use. Varietal response, fertility practices, cultural operations, disease problems, quality control, soil type, time of applications and amount of water applied, are some of the things entering into this relationship.

J. Ross Fleetwood, reporting on Missouri experiments, pointed out that irrigation studies on soybeans have been underway in that state since 1948. Missouri rainfall is sufficient on an annual basis to raise most crops, but there is frequently the problem of critical shortages in July and August. Their studies are set up to determine the response of soybeans to supplementary water applications during these critical periods. Experience has dictated changes in procedure as the studies progressed so it is not possible to directly compare the results of one year with another.

However, the 8-year period of time covered includes 3 years when no supplementary water was needed and 2 years of disastrous drouths. Thus in 1948, 1951, and 1952, no water was added and no response from irrigation was secured in 1949 and 1950; 1953 and 1954 were serious drouth years and rainfall was unusually low in all test fields in 1955.

Missouri tests have been run on three different locations in the state and on entirely different soil types. At the McCredie farm in northeast Missouri on Mexico silt loam, a heavy clay pan soil; at Campbell in southeast Missouri in the Mississippi Delta on fine sandy clay loam; at Elsberry, in the Mississippi River bottoms on heavy Wabash clay.

These fields were given a basic treatment of 4 tons of lime, 1,000 pounds of rock phosphate and 100 pounds of K_2O, with potash maintenance applications each 4 years in addition. Sprinklers were used at Campbell and Elsberry while contour furrows were used at McCredie. Beans were planted in 40-inch rows at McCredie and Elsberry and 28-inch rows at Campbell.

Missouri Results

At McCredie with only 3.93 inches of rainfall during the growing season in 1953, one application of 4.70 inches of water raised the yield of soybeans from 17 bushels to 31 bushels, a gain of 14 bushels.

For the 3 years 1953, 1954, and 1955, with 7.47 inches of rainfall, two applications of 7.50 inches of water

increased yields from 17 bushels to 29, an average gain of 12 bushels.

Seed quality also was affected at McCredie in 1953. Irrigation increased the size of the beans, reduced the protein and increased the oil content.

On the Campbell field in 1954, applications of 12.75 inches of water increased the yield of Ogden from 9 bushels with no irrigation to 32 bushels, and the yield of Dorman from 7.2 bushels to 23.3 bushels, indicating a difference in varietal response.

At the Elsberry field in 1955, 3.7 inches of water in two applications raised the yield of Hawkeye 6.7 bushels, up from 27.2 bushels with no irrigation to 33.9 bushels; Clark 5.6 bushels, up from 31.6 to 37.2 bushels per acre.

Over an 8-year period these experimental results in Missouri have not given large enough increases to justify irrigating soybeans—this in spite of 2 years of very deficient rainfall during the growing season. Only one such dry year is to be expected in an 8-year span of time, under Missouri conditions.

However, it is likely that in a Delta rotation of corn, or cotton, and alfalfa with soybeans along with other crops, irrigation may well be justified, especially in areas having ample water supplies at depths averaging around 150 feet.

Missouri workers believe that soybeans are able to withstand relatively serious drouths during early stages of growth, but that moisture in rather liberal supply is important in the August-September period.

Nebraska Experiments

Donald G. Hanway reported that results of irrigating variety tests at the Scottsbluff Station in extreme western Nebraska have indicated that soybeans can be successfully produced under irrigation anywhere in Nebraska if strains of proper maturity are chosen. However, until methods are found to get considerably higher yields of soybeans under irrigation, this crop will not be able to compete with corn, field beans and sugar beets in return per acre. If the yield could be boosted to 50 or 60 bushels per acre instead of the 30 to 40 obtained thus far, they should look more attractive to farmers in that area.

A limited acreage of soybeans has been irrigated in central Nebraska for over 10 years. Figures for 1955 showed 17,220 acres or about 10% of Nebraska's soybean acreage to be irrigated. The average yield was 20.4 bushels per acre as compared with 8.9 bushels for the state's dryland.

Experiments were started in 1953 which were designed to study effects of irrigation on varieties, row spacing, fertilizer treatments, time and rate of applications, and water use.

In the 1954 tests, the Adams variety planted in 19-inch rows produced 2.3 bushels more per acre than 38-inch rows. Nitrogen applications up to 120 pounds per acre on the 1954 field did not increase yields. This was a very fertile field and was in soybeans the year before. It was underlaid with gravel at a depth of 3 feet which the soybean roots did not penetrate.

The 1955 field chosen was deep, permeable, silt loam of loessial origin with a uniform slope where good water control could be achieved with gated pipe. The previous year this field grew 80 bushels of corn per acre. The soil profile was brought to field capacity to a depth of 5 feet by sprinkling prior to planting Adams soybeans in 40-inch rows on June 3. July, August and September were abnormally hot and dry.

Table 1. Performance of soybeans in 40-inch rows with four irrigation treatments. Central Nebraska, 1955

	Number of Irrigations			
	None	One	Two	Six
Height	30	34	38	39
Lodging	1.0	1.0	1.9	2.1
Yield	18.0	27.5	29.6	32.4
Seed weight	11.2	12.2	12.2	13.6

The single applications of water were made on Aug. 8. The soybeans were approaching full bloom and were suffering severely from drouth at the time. This one timely irrigation increased yields 9.5 bushels per acre. The added five applications received by the "wet" plots increased yields only 4.9 bushels more.

The five nitrogen fertilizer treatments in 1955 were: (1) check, (2) 60 lbs. N/a. sidedressed at planting, (3) 60 lbs. N/a. sidedressed at bud stage, (4) 120 lbs. N/a. sidedressed at planting, and (5) 120 lbs. N/a. sidedressed at bud stage. Ammoniumnitrate was used.

There was a greater response to added nitrogen as the number of irrigations increased. Both adequate nitrogen and available water were required to produce the top yields of about 37 bushels per acre. Plots receiving nitrogen averaged about 6 bushels per acre more than the plots without nitrogen.

The general trend in protein content was downward as number of irrigations increased. Oil percentage increased with nitrogen fertilization and irrigation. Maturity was delayed and lodging and height increased by irrigation. Peak use of water per day was about one-half inch. While the roots did not penetrate the gravel underlay on the 1954 test field, they drew some of their water from the sixth foot of soil in 1955.

Table 2. Consumptive use of water from different depths in the soil by irrigating soybeans. Central Nebraska, 1954 and 1955.

Depth (feet)	Water used (inches) 1954	1955
0-1	8.02	6.43
1-2	5.90	3.22
2-3	3.11	2.29
3-4	gravel	2.37
4-5	gravel	2.17
5-6	gravel	1.88
Rain	6.10	7.14
Total	23.13	25.88

Arkansas Tests

A. E. Spooner reported on soybean irrigation in Arkansas. Irrigating

—Soybean Digest Photo

IRRIGATING soybeans on the H. L. Johnson farm near Newton, Iowa. Mr. Johnson grows 155 acres of the Hawkeye variety and irrigates both corn and beans from wells. The boom will cover over 3 acres with 1 inch of water in an hour.

soybeans has become a regular practice in certain areas of Arkansas. About 10% of the state's soybean acreage was irrigated in 1955. Most of the irrigation naturally is in areas where a good source of water is available and the soybeans can be flooded or furrow irrigated. Not many growers use the sprinkler method due to increased labor and equipment costs.

Farmers in the rice area are ideally situated to irrigate soybeans since the land has already been leveled and irrigation equipment purchased for growing rice. Spooner pointed out that the soybean crop will not carry the entire cost of an irrigation setup. The grower must have some other crop such as cotton or rice to help absorb the cost and aspiration of the system.

Table 3. Yield of soybeans as influenced by different irrigation treatments. Average of seven replications. Rice Branch Experiment Station, Stuttgart, Ark., 1955.

Irrigation treatments	Number of irrigations	Inches of water applied	Yield	Increase due to irrigation	Increase per inch of water
			—Bushels per acre—		
DORMAN					
Check	0	0	15.84	0	
Irrigation started at first bloom	3	4.5	28.31	12.83	2.58
Irrigation started at seed set	3	4.5	26.78	11.30	2.51
Irrigation all season as needed	5	8.5	28.75	13.27	1.56
LEE					
Check	0	0	17.14	0	
Irrigation started at first bloom	3	4.5	34.44	17.30	3.84
Irrigation started at seed set	3	4.5	36.66	19.52	4.34
Irrigated all season as needed	5	8.5	32.87	15.73	1.85

LSD 5% = 3.83 bushels
LSD 1% = 5.31 bushels

Both the Dorman and Lee varieties gave a tremendous response to irrigation. The yields were approximately doubled for both varieties. There was no significant difference due to the time at which the irrigation cycle was started within a variety; however, Lee gave a greater response to irrigation than Dorman when compared to the checks. It is interesting to note that the greatest increase per inch of water applied was obtained by delaying the irrigation cycle until the bloom or seedset period. Under the conditions of this experiment, it was concluded that the most critical period of water use by soybeans is during the fruiting stage.

There appeared to be no effect on protein content regardless of irrigation treatment. Oil contents were not checked. The plots were fertilized according to soil test and seeded June 1 in 36-inch rows.

The non-irrigated Dormans matured about 20 days before the irrigated; however, the reverse was true for the Lees. The irrigated Lees matured about 5 days earlier than the non-irrigated. This was attributed to a rain in late September which allowed new growth to occur on the non-irrigated Lees.

Soybeans have been grown in Arizona and southern California for only the past few years and a number of problems other than irrigation remain to be solved before satisfactory yields can be produced. In the 1955 tests at Brawley in the Imperial Valley of California, even with high rates of irrigation—38 inches of water—yields did not exceed 35 bushels.

In tests at Lubbock, Tex., with an average annual rainfall of 19 inches, the Lee variety produced 28 bushels per acre with irrigation.

Mississippi Results

The rainfall in Mississippi is high, 51 inches in the Delta area, but frequent drouths occur during the growing season. This has led to interest in irrigating soybeans as well as other crops.

In 1952, 1954 and 1955, corn, cotton and soybean irrigation studies were conducted in the same area on sandy loam soil. In all years the response of soybeans to irrigation was less than that for cotton or corn. In each case soybeans began wilting considerably later than corn or cotton.

Table 4. Responses of corn and soybeans in 1952 and 1954. (Rainfall during each of these years was about 6 inches.)

Year	No. of times irrigated	Inches of water applied	Corn yield	Soybean yield
1952	None	0	68.6	24.5
	1	2		29.3
	2	2	85.0	
	5	10	91.0	31.7
	7	14	97.7	30.9
1954	None	0	73.0	37.4
	1	3	77.1	44.3
	3	8	94.9	
	4	12	98.9	44.5
	7	14		40.6

Conclusions drawn from these and other experimental results were: (1) Soybean yields have been increased 6 to 10 bushels per acre by irrigation in some of the driest years on record; (2) irrigation before the fruiting stage began did not appear to be beneficial; (3) soybeans remained in an unwilted condition much longer than cotton or corn under drouth conditions.

If soybeans are to be irrigated in Mississippi, land leveling must first be done to permit row irrigation. On relatively level land, the cost of land leveling will be approximately $100 to $125 per acre.

Hartwig believes that under Mississippi Delta conditions the problem of conserving the rain falling in the non-growing season deserves more consideration than irrigation. Many of the sandy or silty loam soils have a compaction layer extending 6 inches to 20 inches below the surface. Shattering of this compaction layer permits penetration of winter rainfall and penetration of roots the following season. Fall plowing of the heavy clay land so as to leave a rough surface conserves more of the winter rainfall than does the standard practice of throwing up rows with a middlebuster. He reports that these practices give increased soybean yields almost as large as those from irrigation.

In conclusion he stated, "Although possibilities exist for increasing soybean yields in Mississippi by irrigation in dry years, it does not appear to me that irrigation would be a profitable practice at the present time. The results obtained indicated that one late irrigation is nearly as effective as more frequent irrigation. In many cases, if a grower is equipped to irrigate corn, cotton or rice the peak needs of these crops will be past by late August and this equipment can then be used to give soybean varieties, such as Lee or Jackson, additional water at a time when they are most likely to give maximum response."

Soybeans Are Being Grown In Florida, Alabama

Soybeans are now the leading crop in one Florida county!

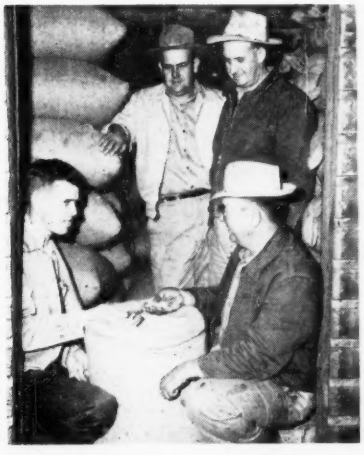
By **WILLIAM G. MITCHELL**
Assistant Editor, Florida Agricultural Experiment Station

A TOURIST from the North, traveling to the sunny beaches of Florida, might be surprised to see soybeans—long a Northern crop—growing in abundance in the sunshine state.

But such a tourist would be very likely to see such fields of soybeans; especially if he were to travel through Escambia County in west Florida. County Agent E. N. Stephens of Escambia says that farmers in his county planted some 15,500 acres of beans in 1955. This acreage placed soybeans ahead of all other crops being grown in that county.

Here's additional evidence to prove that soybean growing is on the increase in Florida. In 1953, the amount of land planted to soybeans in the Sunshine State was 12,000 acres. In 1955, Florida farmers planted over 40,000 acres to soybeans; last spring, 43,000.

To find out some of the reasons for this rising popularity of soybeans, we talked with the Haufler brothers—last year's Alachua County corn contest winners, soybean growers, and owners of several thousand acres of land near Gainesville.



Assistant County Agent A. T. Andrews, left, of Alachua County, Fla., discusses their yield with the Haufler brothers, (left to right) Oscar, Ernest, and Eugene. The brothers plant soybeans following watermelons.

The brothers are Oscar, Ernest and Eugene.

"Soybeans have made us money," they told us. The Haufler brothers have planted soybeans after watermelons for the past 3 years. For fertilizer, they have relied on the residual fertility from the watermelons. Yields were 25 bushels per acre, about 20 bushels per acre in 1954—this is about the state average—and close to that same figure last year.

These are not spectacular yields, but the Hauflers point out that they plant later than they should because of following their watermelons. But they feel this is a worthwhile practice, even so. Oscar says, "Soybeans would be worth planting as a cover crop after our watermelons, even if prices were very low."

Another point—the Hauflers think the oats they plant after their soybeans for fall and winter grazing definitely benefit from the beans. "The oats we have planted after soybeans looked good," they declare.

One of the big reasons for the increase in acreage in Florida is the release of new better-adapted soybean varieties—Jackson and Lee.

Dr. Irvin Wofford of the Florida Agricultural Experiment Stations says that Jackson seems to be much better adapted to Florida conditions than older varieties.

Lee was released in 1954. It was designed to replace the old standby, Ogden.

Another reason many farmers in Florida are taking a closer look at soybean growing is that more local markets are being made available. For example, the Southern Oil Processing Plant at Brooker, Fla.—which was originally built to process tung oil—has now rearranged its facilities so that it can also crush soybeans.

The growing cattle, hog, and poultry industries in Florida are a ready outlet for the soybean cake left after crushing the oil from the beans. G. W. Morrow, head of the Greenwood Products Co. of Graceville, Fla.—whose company is also crushing soybeans now—tells us that they add the vegetable protein from soybean crushing back into supplements and concentrates to be fed to livestock and poultry.

Agronomist Russell Henderson of the Florida Agricultural Extension Service says the pattern of soybean growing in Florida seems to be that the beans are usually planted after oats, winter vegetables, watermelons or crops of this kind. They are not usually planted as a main crop. As a catch crop, soybeans can use residual fertilizer, keep the land in production more months in the year, and serve as a summer cover crop. Of course, most farmers fertilize their beans after oats.

Even growers on Florida's rich muck soils have tried soybeans—with varying results. More cultivations are needed here. B. Tarlow, manager of the Orlando Farming Corp. near Zellwood, cultivated his beans seven times last year. In contrast, the Haufler brothers, whose beans were on new ground in mineral soils following their watermelons, cultivated only once.

Tarlow, who planted a 1,000-acre "test block" to soybeans last year, believes his beans ran as high as 40 bushels per acre. But the actual harvested yield was about 20 bushels. Others on muck soils have planted soybeans in smaller acreages with more or less success.

The Cover Picture

Part of the harvest of beans from 1,000 acres of soybeans grown at Zellwood, Fla., on muck soils. In the background is part of the soybean planting. These beans were harvested with self-propelled combines and hauled in semi-trailer trucks to the mill for crushing.

NEW ORLEANS visit (at left) included tour of the harbor in the Board of Commissioner's boat, the Good Neighbor. Tour in Iowa included visit at the home of Wayne Lichty, Black Hawk County (Iowa) farmer, (standing) who is assistant executive director of the Soybean Council of America. Among his guests were, left to right, S. Toriumi, K. Abe, G. Kawamura and K. Matsuoka.

MINNESOTA part of tour included visit to farm of Richard Wigley near Mankato. Third from right is Vernon (Scoop) Welch, commodity director of the Minnesota Farm Bureau.

AT CHAMPAIGN, Ill., group inspects soybean oil meal held by Wayne Lichty. Others, left to right: Joe Johnson, who arranged the tour, I. Matsuhara, S. Toriumi, and G. Kawamura.

AT MEMPHIS, the Japanese visitors talked over the soybean situation with Fred Lovitt, president of the Memphis Board of Trade, in front row center. Others in front row, left to right, G. Kawamura and Y. Sakaguchi. Back row, left to right, Y. Hosoya, I. Matsuhara, S. Morohashi, K. Abe, K. Matsuoka and S. Toriumi.

Japanese Saw Our Industry Firsthand

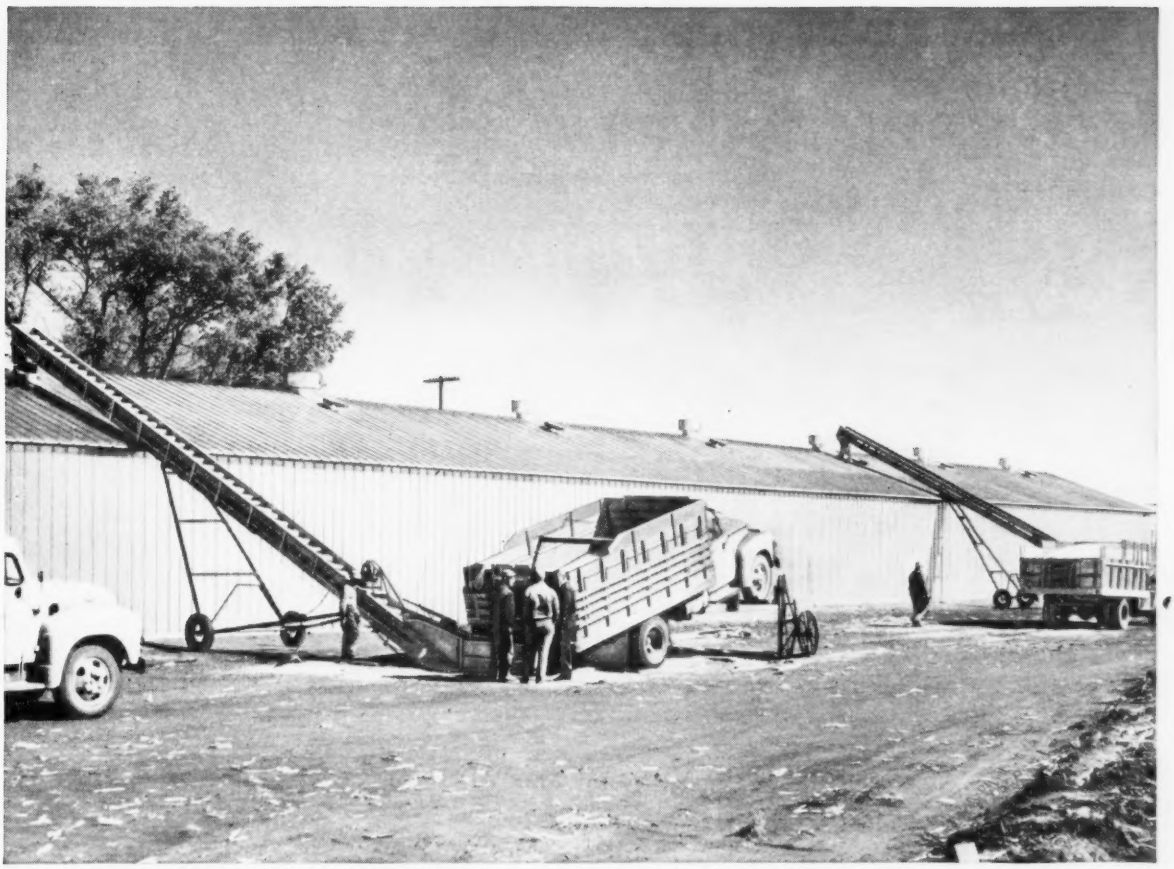
GLIMPSES of the U. S. soybean tour by Japanese industry representatives are shown on this page.

They came to see the U. S. soybean industry from farm to final usage and returned home to report on what they had seen to their respective industries. The tour started with attendance at the American Soybean Association convention at Urbana, Ill., in mid-August, and ended with a visit to the U. S. Department of Agriculture in Washington in early September.

The tour was part of the program of the Japanese-American Soybean Institute. Its purpose was to better relations between Japanese and American soybean trade groups. The Japanese hope to get out of it better soybeans for their food industries ... fewer damaged and colored beans, and less foreign material. The Americans hope to get a bigger market for U. S. soybeans from the country that is already our best foreign customer.

—Photos courtesy Waterloo (Ia.) Courier, Champaign (Ill.) News-Gazette, Memphis Commercial Appeal, and Mankato (Minn.) Free Press.

AT MOBILE Public Elevator group checks soybeans for foreign material.



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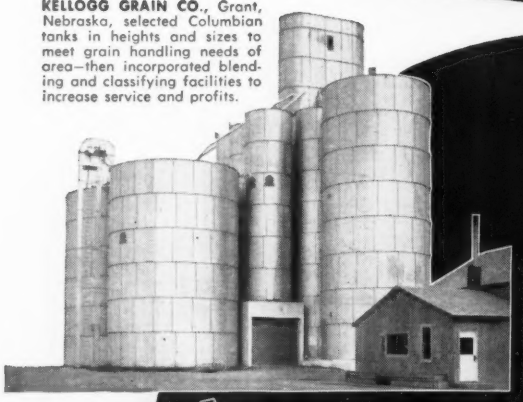

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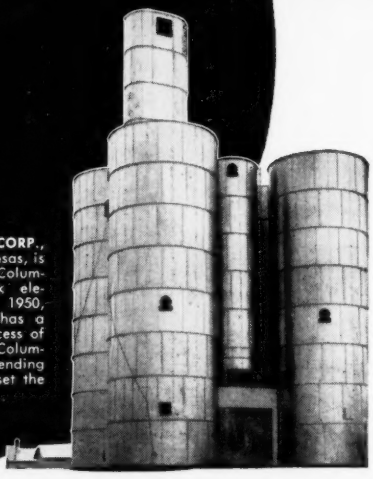

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AMERICAN SOYBEAN ASSOCIATION

Late News

Oct. 5, 1956
Hudson, Iowa
Vol. 4, No. 21

Published 32 times yearly as a service to the soybean industry.

HARVEST PROGRESS

Though combining in the northern bean belt did not start quite so early as in 1955, clear dry weather in late September and early October made for ideal harvest conditions most places and harvest was making rapid progress. **By the first of October the great bulk of the crop was out of the field in Illinois,** the leading soybean state, and combining was well under way in Iowa. Harvest of late beans won't be completed until the last of October in Illinois.

The crop was about out in the Lafayette, Ind., area. Geo. K. Black at Evansville, Ind., reports the crop about 30% harvested in southern Indiana with the outlook for completion by Oct. 15.

The harvest was 70% completed in Kansas by Oct. 1, having been hurried along by drouth. Fred Hafner, General Mills, Minneapolis, expects the bulk of the Minnesota crop to be harvested by Oct. 15. **Combining in Ohio will not be general until Oct. 15,** according to the state crop reporting service. But Calvin Heilman at Kenton, Ohio, reported the crop 50% out of the field in his area by late September.

The crop has suffered much drouth damage in Oklahoma, Missouri and Mississippi with more moisture needed to fill pods of late beans in Arkansas, according to the Weather Bureau.

Some weedy fields are being reported in Illinois. There has been scattered frost damage in northern areas and in Maryland-Delaware. Late beans were badly frozen in Middlesex County, Ontario. Conditions are "too dry" in south central Minnesota with complaints of splitting and cracks. Hurricane "Flossie" did some damage to the crop in Alabama and Florida.

LATE REPORTS ON YIELDS

The utmost variation is reported in Iowa yields, with some areas abandoned or cut for hay due to drouth and some yields up to 40 bushels per acre. Severe hail damage is reported some places.

A Virginia report is that the early acreage is well podded and a heavy yield is expected. The late acreage had too much rain during the blooming period and pods are not as well set as hoped.

The Canadian crop may about equal last year's 5½ million bushels, according to the Ontario Soya-Bean Growers' Marketing Board. But this figure may be drastically reduced if weather conditions do not remain ideal through harvest.

H. I. West, Bay Minette, Ala., reports 125,000 acres of soybeans to be harvested in the four counties of Baldwin, Mobile and Escambia, Ala., and Escambia County, Fla., with the largest acreage in Baldwin County.

The Arkansas crop reporting service calls the final outturn in that state below expectations.

HOLDING MOVEMENT

The earlier rumored holding movement on the part of farmers has definitely materialized. Grain men say soybeans are not being sold in volume, and estimates are that **only 10 to 30% are being sold outright in many heavy producing northern areas.**

One Illinois estimate places the part of the crop to be sold at 25-30%. J. E. Johnson, Champaign, Ill., reports local elevators are buying about 1 bushel in 10 delivered.

Glenn Pogeler, Mason City, Iowa, reports only 10% being sold in his territory. "Unless prices rise, as many beans as can will be put under loan," he says. In general, Iowa reports are that farmers plan to hold.

Fred Hafner at Minneapolis believes **over half of the Minnesota crop will go under loan.** He says storage will be sufficient. Maurice Maze, MFA, Mexico, Mo., estimates 80% of the northeast Missouri crop will go under loan.

G. G. McIlroy, Irwin, Ohio, says grain men believe few soybeans in west central Ohio will be sold at the time of delivery and 75% of the crop will go under loan. Louis Brewster, General Mills, Rossford, Ohio, reports 10-20% of the crop is being sold so far.

Black at Evansville, Ind., reports farmers are selling, 30% of the crop, but believes so long as the market is above $2 few will go under price support.

But we have reports from **Kansas, Oklahoma, southeast Missouri and Mississippi that a large part of the crop is being sold outright in those areas.**

QUALITY IS GOOD

Quality of the crop is good, probably as good as the excellent crop of last year, with moisture content no problem, according to our reports to date.

Weeds are causing high foreign material content in some northern as well as southern areas. **Early reports indicate oil content may be a little lower than in 1955.**

CCC POLICY ON 1956 CROP

Commodity Credit Corp. will not undercut the market by dumping takeover beans after the loan maturity date next May 31, USDA announced Oct. 1.

Takeover beans will not be sold for less than the support price plus a reasonable carrying charge or the market price, **whichever is higher,** according to USDA.

CCC's announced policy will be in effect from next May 31 to Oct. 1, at which time a reappraisal will be made of the policy.

Washington observers believe the announcement was made at this time to help the market during harvest, and **also to put European buyers on notice that CCC will not put beans on the bargain counter after next May 31.**

	Cash prices Sept. 28
Soybeans, No. 2 yellow, Chicago, bu.	$ 2.29½
Soybean oil meal, Decatur, ton	48.50
Soybean oil, crude, Decatur, lb.	.11⅝

	Cash price to farmers for No. 1 soybeans Sept. 28	Cash price to farmers for No. 2 soybeans Sept. 28	Retail cash price for bagged soybean oil meal Sept. 28
Ark.		$2.07	
Fla.	$2.16		
Ill.	2.10@$2.12		$70@$75
Ind.	2.03@ 2.06		80
Iowa	2.05		72
Kans.	2.06	2.06	67
Miss.	2.10	2.05	
Mo.	2.00@ 2.05		
N. C.		2.10	
Ohio	2.05@ 2.11		
Okla.	1.95	1.95	71

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Recent Developments in Soybean Disease Work[1]

Bacterial blight, Fusarium root rot, stem canker, nematodes, Phytophthora root rot, and downy mildew are among diseases getting attention. From address before the American Soybean Association convention at Urbana, Ill.

By JOHN DUNLEAVY

Plant Pathologist, Iowa State College, Ames, Iowa

SOYBEANS are relatively disease-free when compared to some other major crops. There are about 50 diseases affecting soybeans in the United States and when this figure is compared to over 300 diseases of potato, one can but sympathize with the plant breeders and pathologists working with potatoes. Of the 50 soybean diseases about 15 are serious enough to present real problems to growers over wide areas. The remaining diseases may be serious locally but usually appear only sporadically or, if they appear regularly, they may cause little damage.

Soybean diseases have become more important in recent years because of the intensification of soybean production in many areas and the introduction of the crop in others. Short rotations and the practice of growing beans in the same field in successive years tends to allow disease organisms to become more prevalent. As production increases in an area the chances for disease to spread from one field to another increases greatly. Under such conditions bacterial diseases might be spread by rain water flowing from one field into others; fungus leaf spot diseases might be spread to nearby fields by spores blown by the wind; and virus diseases might be spread to adjacent fields by insects.

When soybeans are introduced as a new crop into an area the seed obviously must be brought in from other areas. Let us suppose that in the area where the seed was grown a minor soybean disease existed that was transmitted through the seed to succeeding crops. In this area the weather and other environmental conditions were such that the disease could not make rapid progress and so was of a minor nature. When this seed was shipped into the new area of soybean production where the growing season was cooler and the rainfall heavier, the disease developed very rapidly from field to field and thus became a major soybean disease. It is this sort of situation that has complicated the soybean disease picture in recent years.

John Dunleavy

There are now more plant pathologists working on soybean diseases than in the past, and these workers are keeping the public informed of disease outbreaks on a local scale that might not have been reported 10 years ago. By combining the disease reports from the different soybean growing regions of the country we have an overall picture of disease development that is much more meaningful than single reports prepared only for the local areas.

A major step forward in soybean disease work was recently taken with the adoption of soybean disease classification standards for nursery and survey ratings. Previous to the use of the new standards, individuals working with soybean diseases used different systems of classification so that it was difficult to compare notes on a given disease. With the new standards, a certain rating for bacterial blight means the same to a plant pathologist in Minnesota as it does to one in Mississippi.

To the layman, plant disease may appear a rather simple problem. After all we now have a spray or a dust to control most insects on plants; why not use similar materials to control plant diseases? Several states are working on this approach to plan disease control. D. W. Chamberlain is studying the effect of various chemicals and antibiotics on control of bacterial blight of soybean in Illinois. In Iowa, M. C. Shurtleff and I are determining the effects of various chemicals added to the soil for the control of Fusarium root rot.

Problems with Chemicals

The future of this type of disease control appears to have some promise. However, there are difficulties. The problem is not simply one of finding a chemical that will kill the disease organism without killing the plant. In addition, the material must be easy to apply or few will use it; it must be cheap or few will buy it; and it must be nontoxic to humans and animals if deposited in the seed by the plant. I'm sure you will agree that is quite an order.

Another approach to soybean disease control is the development of disease resistant varieties. This is begun by a search for resistant plants among soybean varieties, most of which are poor from an agronomic standpoint. Most of these varieties have been introduced from other countries and are called plant introductions. A complete collection of plant introductions is maintained in the germplasm bank at Urbana, Ill., and Stoneville, Miss. Over 4,000 types of soybeans are maintained in this collection. Pathologists usually test a certain number of plant introductions each year until a plant with good disease resistance is located. Then the plant breeder begins to incorporate this resistance into a new, high-yielding soybean variety. A number of years follow in which an intensive disease testing and breeding program is carried out before a new, disease-resistant soybean variety can be released for production. It was just such a procedure as this that was followed in the development of Lee, a new, superior, disease-resistant variety developed cooperatively by the U. S. Department of Agriculture and the experiment

[1] Joint contribution from the Iowa Agricultural Experiment Station and the Field Crops Research Branch, Agricultural Research Service, U. S. Department of Agriculture. Journal Paper No. J-3003 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 1179.

Table 1. Increases in yield resulting from soybean improvement by hybridizing plant introductions and selecting recombinations of characters. Varieties listed are comparable in maturity.

Variety:	Description:	Average yield (bu./a.):	Increase in average yield (bu./a.):
Illini Dunfield	plant introductions	26.4	4.5
Lincoln	result of first cycle of improvement	30.9	1.9
New variety	result of second cycle of improvement	32.8	

Fig. 1. Soybean leaflets resistant (left) and susceptible (right) to bacterial blight. Both leaves were inoculated with the disease producing bacteria.

Fig. 2. Fusarium root rot of soybean (right). The diseased plants were grown in fungus infested soil but the healthy plants (left) were grown in steamed soil.

Fig. 3. A stem canker developing on a soybean stem.

stations of 12 southern states. Lee is resistant to bacterial pustule, wildfire, frogeye and purple seed stain which are all important diseases in the South.

When resistance to several diseases is desired in a single variety the difficulties encountered by plant breeders and pathologists in developing such a variety are greatly increased. For example, if a breeder is considering only one disease and resistance is conditioned by a simple recessive gene, his selection is restricted to only one-fourth of the plants in the second generation following a cross between two plants. If two such diseases are considered simultaneously, then only one-sixteenth of the plants contain the desired combination, and if three diseases are considered, only one-sixty-fourth of the plants contain the desired combination of disease resistance. The complexity of breeding for multiple disease resistance becomes apparent when one considers that a plant breeder must select plants that not only have disease resistance but high yield, the proper date of maturity, height, resistance to lodging, high oil content of seed and the many other characteristics that determine a superior variety.

If one would investigate the history of soybean development in this country he would find that many of the early varieties were simply plant introductions. The varieties Illini and Dunfield could be placed in this class. Over a period of years these two varieties have an average yield of 26.4 bu./a. when grown in soybean test plots (Table 1). The first cycle of improvement was begun and as a result the variety, Lincoln, was produced which replaced Illini and Dunfield and has an average yield of 30.9 bu./a., an increase of 4.5 bu./a. The second cycle of improvement was begun and a new variety developed to replace Lincoln. This variety, not yet released, has an average yield of 32.8 bu./a., an increase of 1.9 bu./a. over that of Lincoln. The point that I wish to make is that with each succeeding cycle of improvement it becomes more difficult to increase yield. But something can and is being done to increase yield indirectly.

Annual Disease Loss

Estimates for the entire country covering the 10-year period, 1942-51, indicate that annual losses due to disease amount to approximately 12½% of the crop. In other words, if soybeans were resistant to all diseases we could expect an increase in yield of about 12½%. Obviously we have no such resistant variety, but by developing new varieties resistant to the major soybean diseases we can increase the yield.

One factor that seriously complicates estimating disease loss is that we actually have very little information on how many bushels per acre a given disease of a given intensity can decrease yield. One approach to the estimation of losses caused by specific diseases is the development of

lines that are genetically very similar but one is resistant to the disease and the other susceptible. Thus a measure of disease loss is easily obtained by measuring the difference in yield between the two lines in a year when disease is prevalent.

In my research I have approached the problem in a different way. By spraying certain rows with an antibiotic, streptomycin sulfate, the plants are protected from bacterial blight. Other rows are sprayed with the bacteria and the difference in yield determined at the end of the growing season. Results obtained last year indicate that we may have underestimated the ability of bacterial blight disease to reduce yield. Because bacterial blight may be more important than realized previously, we are striving to develop high resistance in our new soybean varieties (Fig. 1).

Fusarium Root Rot

For many years in Iowa, people in soybean work have been noticing the reddish-brown discoloration on soybean roots that is a symptom of Fusarium root rot. Sometimes a few of the seedlings would die, but in general the root condition was never considered a serious disease. Several years ago, I began a study of this condition and the results were quite surprising.

Although Fusarium root rot is not as devastating as a number of other soybean diseases, it is nevertheless important because of the reduction in plant vigor by the action of the fungus on the plant roots. The disease is most destructive to seedling roots that consist of tender, succulent tissue (Fig. 2). This disease as observed in Iowa only rarely causes death of the plants after they have passed the seedling stage. Young plants sometime have the complete root system destroyed. The rot usually stops near the zone between root and stem, probably because of a barrier type of action on the part of the stem tissues. The fungus can attack this area of the plant only with great difficulty and if the seed was planted deep enough, lateral roots usually develop from this area and eventually may allow the plant to continue development, although markedly stunted. Sometimes seedlings are killed before they emerge from the ground, while in other cases, the cotyledons are infected and may fall to the ground without the fungus causing any additional injury to the plant. Most typically, however, the fungus infects one of the outer portions of the root called the cortex and the many hundreds of small root tips. When a root tip has been killed by the fungus the plant forms new root tips to compensate for the lost tissue. Thus, badly infected plants have very shallow, fibrous roots and in most cases lack a tap root.

Plants were grown in boxes in the greenhouse to determine more exactly the effect of the disease on plant development. Roots of plants grown in contaminated soil all lacked tap roots and were poorly developed. Leaves on these plants were a pale green and smaller than those of the control plants. Diseased plants grown in contaminated soil were shorter in early stages of development than healthy plants grown in noncontaminated soil. The healthy plants matured about two weeks later than the diseased plants and were slightly taller at maturity. The diseased plants produced poor quality seed. Many of the seeds were small and poorly developed and

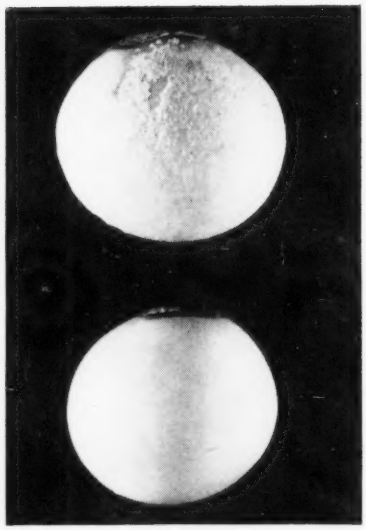

Fig. 4. The soybean seed at top is encrusted with spores of the downy mildew fungus. The seed at bottom is clean.

probably resulted from the hastened maturity. The healthy plants had twice as many pods as the diseased plants and the average pod size was larger. Yield of beans from the healthy plants was over twice that obtained from the diseased plants.

Fusarium root rot was found to occur in 95% of the Iowa soybean fields examined in the disease survey in 1955. This year the disease was found in 62% of the fields and plants were not as severely affected as last year. Early in the season fields that have the disease present appear to have nothing worse than a poor stand. Short gaps of from a few inches to a foot or more occur at frequent intervals in the rows. Plants adjacent to the gaps are short and a few may have been killed. Frequently the gaps do not appear and one finds only alternate segments of short and tall plants. If roots of the short plants are examined the typical reddish-brown discoloration and rotted root distinguish the disease from irregular germination which also can cause differences in plant height. After the middle of July it is difficult to find the disease in fields because the gaps in the rows are filled by more vigorous plants nearby.

Doing Research

Research is being conducted on this disease in Missouri, Minnesota and Iowa. Research on Fusarium root rot control in Iowa is taking three lines: a search for resistant varieties, a study of the effect of crop rotation, and the use of various chemicals and fungicides for seed and soil treatments. Results of tests this spring indicate a few southern varieties have some resistance to the

disease; however, additional tests will be required to confirm this.

Stem canker is another of the diseases receiving attention in the regional soybean disease research program. This disease occurs in August and September and is characterized by the formation of a canker on the lower portion of the stem (Fig. 3). The plant is killed soon after the formation of the canker. This disease is potentially one of the most serious soybean diseases. Recent research on this disease has been conducted in Indiana, Minnesota, Ontario, Canada, and Iowa.

Another soybean disease-producing organism that should be considered is the nematode, a very small roundworm that is found in soil and the roots of certain plants. Nematodes are a problem only in the South and consequently research on this problem is conducted there. A search for resistance to the rootknot nematode and development of new resistant varieties is being conducted in North Carolina, Delaware, and Mississippi.

Seed quality is another of the problems of producers in the Southern states. Research on purple seed stain and other diseases affecting seed quality is being carried on in Mississippi.

Phytophthora root rot is a very serious disease in certain sections of Ohio and has also been reported in other North Central states. The disease was first discovered and described by research workers in Ohio who also found resistant varieties. Plant breeders and pathologists in Illinois have found other varieties resistant to this disease and are studying how resistance is inherited.

Downy mildew is a disease that well illustrates some of the difficulties in breeding disease resistant varieties. Varieties resistant to downy mildew are not difficult to find in a given area, but when these resistant varieties are removed to other parts of the country they may become susceptible. The reason is that a number of races of mildew exist, each race having the ability to infect only certain soybean varieties. If varieties are grown in areas where different races of mildew are prevalent they may be infected and thus are no longer resistant. This means that in order to develop a truly resistant variety, all races of mildew that occur where the new variety is to be grown must be identified and their pathogenicity tested on the new variety. If the inoculated plants remain healthy the variety is resistant; if not, the search for resistance must be continued. The situation is further complicated by the fact that downy mildew is seedborne (Fig. 4). Thus different races of mildew may be introduced into the new area whenever soybean varieties are grown out of their range of adaptation.

Filtration-Extraction Process Achieves Commerical Status[1]

Mississippi plant, based on process developed by the Southern Utilization Research Branch, has been in operation almost 2 years. Mr. Gastrock tells the advantages of the new process.

By E. A. GASTROCK
Southern Regional Research Laboratory[2]
New Orleans, La.

THE FILTRATION-EXTRACTION plant of the Mississippi Cottonseed Products Co.[3], located at Greenwood, Miss., has been in practically continuous operation on cottonseed and soybeans since Jan. 26, 1954. This plant was designed, constructed, and erected by Lukens Steel Co.[3], based on the initial bench-scale and pilot plant scale development work of the Southern Utilization Research Branch of the Agricultural Research Service. Active cooperation was maintained between the Southern Branch, Lukens Steel Co., and Mississippi Cottonseed Products Co. throughout all phases of the project, including the initial operations on cottonseed and soybeans.

The success achieved in this first installation has now led to construction on the part of Mississippi Cottonseed Products Co. of a second plant of the same size and for the same raw materials.

From the vantage point of this 2-year period of experience with the new process it is possible to present information and operating data of anticipated interest and value to soybean processors.

Filtration-extraction is a direct process and does not depend on prepressing for efficient extraction of widely varying oilseeds such as cottonseed, soybeans, rice bran, flaxseed, peanuts, sesame, and castor beans. The foregoing statement is very important for mills that process more than one oilseed raw material. In commercial operations for cottonseed and soybeans the early claims for the process, based on bench-scale and pilot plant scale developments, have been equalled or bettered.

The filtration-extraction process departs in a number of details from traditional solvent processes and has been described in several recent articles (3, 6, 7, 14). The process was developed as a result of engineering inquisitiveness. We asked ourselves this question: Can a solvent extraction process be developed, based on filtration principles?

We knew that this would be a further development of percolation-type extractors which use only gravity drainage for the separation of the solid phase from the liquid phase. We wanted to use a greater driving force than gravity—either vacuum or pressure—in order to achieve a more efficient separation of liquid from solids in the extraction and washing steps.

It was also realized that immersion extractors had the advantage of close contact between solvent and solids and thus promoted extraction. This advantage would be lost if we depended on filtration alone. So we combined the two processes and added an immersion step ahead of the filter.

The flow diagram of the process is given in Figure 1. Prepared cottonseed or soybean flakes are cooked in conventional four-to-six-high stack cookers, using somewhat lower temperatures and shorter cooking time than normally used for hydraulic cooking of cottonseed. Moisture content of the material is maintained throughout the cooking period at levels higher than for hydraulic cooking. For soybeans, the cooking step is an innovation. The cooked material is "crisped" by evaporative cooling and by reducing the size of any large agglomerates formed during the cooking operation. The conditioned material is mixed with one of the miscella filtrates to form a slurry which is held for 35 to 45 minutes. The slurry is filtered, and the resulting cake countercurrently washed three times on a horizontal rotary vacuum filter. Total time on the filter is from 1½ to 4½ minutes. The solvent-damp extracted meal (marc) is discharged to a conventional desolventizer for meal and solvent recovery. The concentrated miscella is pumped to the oil recovery system for separation of oil and solvent.

The important features of the filtration-extraction process can be discussed to best advantage under two headings, preparation and extraction.

Preparation

Proper preparation is necessary in order to provide extractability, filterability, a reasonable minimum fines content, and proper size distribution. Filterability is accomplished by preparing a material that is relatively incompressible. It is measured by a term called *mass velocity*, which is the pounds of liquid passing through 1 square foot of filter bed per hour. Five operations are included under preparation.

Hulling. Soybeans and cottonseed are both hulled. The more complete the removal of hulls, the more efficient and uniform will be the following operations and the greater the capacity of the equipment. However, some or all of the hulls may be added to the meats prior to extracting, or after, in order to lower or control the protein content of the final meal product. In the case of soybeans it is desirable to return any hulls to the meal products after solvent extraction.

Conditioning Prior to Rolling. The purpose here is to help rolling. For cottonseed and soybeans a temperature and moisture content should be used that will not quite produce a plastic flake. This promotes oil release (not actual oil flow) but uses slightly more power than if the operation was in the plastic range. The optimum moisture is somewhat proportional to the oil-free, moisture-free meal content.

Rolling. Adequate rolling capacity cannot be over-emphasized. Five-high, heavy-duty rolls are satisfactory for both cottonseed and soybeans. In the case of cottonseed, rolling also weakens or ruptures the pigment glands, so that the gossypol therein may be bound during the cooking operation, thus producing better oil and meal. In rolling for filtration-extraction, *fines need not be avoided.* The cooking operation consolidates them later. The goal

[1] Presented at the Plant Operations Symposium of the National Soybean Processors Association, Chicago, Ill.
[2] One of the laboratories of the Southern Utilization Research Branch, Agricultural Research Service, U. S. Department of Agriculture.
[3] Cooperation between the Agricultural Research Service and this Company under Memorandum of Understanding.

is a balanced screen analysis to provide: (1) oil release, (2) rapid extraction, and (3) good washing and drainage on the filter.

Cooking. Cooking time is short (25-40 minutes) for very soluble proteins such as in soybeans. Longer times (40 to 75 minutes) are needed for cottonseed. Temperatures need not exceed 225° F. The moisture content for cottonseed and soybeans will be between 12 and 20%. Moisture is dependent on oil content, protein content, protein solubility, starch content, and other characteristics of the material. The functions of cooking are: (a) to complete the oil release started in conditioning and rolling, and to put moisture on the inside and oil on the outside of the particles; and (b) to agglomerate the fines. Where protein content and starch content cannot be depended on for agglomeration, a higher final moisture content may be used. The final moisture content must be from about 8.5 to 13%.

Crisping. From 1% to 3% of water is purposely lost by evaporative cooling during the conveying operations. Crisping gives the cooked particles their relative incompressibility needed for filtration rates that result in high filter capacities. As a result, each particle appears to be separate from the other. A handful when pressed together can be easily separated.

Extraction

Two operations are included under extraction, slurrying and filtration.

Slurrying. The slurry mixer is a mildly agitated, horizontal tank. The purpose of the slurrying operation is to put the oil into solution at the highest possible concentration. One of the filtrates from the filter is the extracting liquid. During the slurrying operation this filtrate will increase in concentration from about 10 to about 25% or more of oil. The time, temperature, agitation rate, percentage of solids, miscella concentration, and perhaps other factors may be varied. These variables are mostly interrelated. As previously mentioned the slurrying operation requires from 35 to 45 minutes.

Filtration. The filter is a commercially available horizontal, vacuum unit made by Dorr-Oliver[4]. It performs the following functions:

1—It separates concentrated miscella from the solids in the slurry.

2—It may refilter this concentrated miscella to reduce the fines content and to produce a final miscella.

3—It provides for an effective, multi-stage countercurrent wash in which oil-free hexane is used as the final wash.

[4] In using the name of equipment manufacturer it should be understood that the Department of Agriculture is not recommending the products of one manufacturer over similar products of other manufacturers.

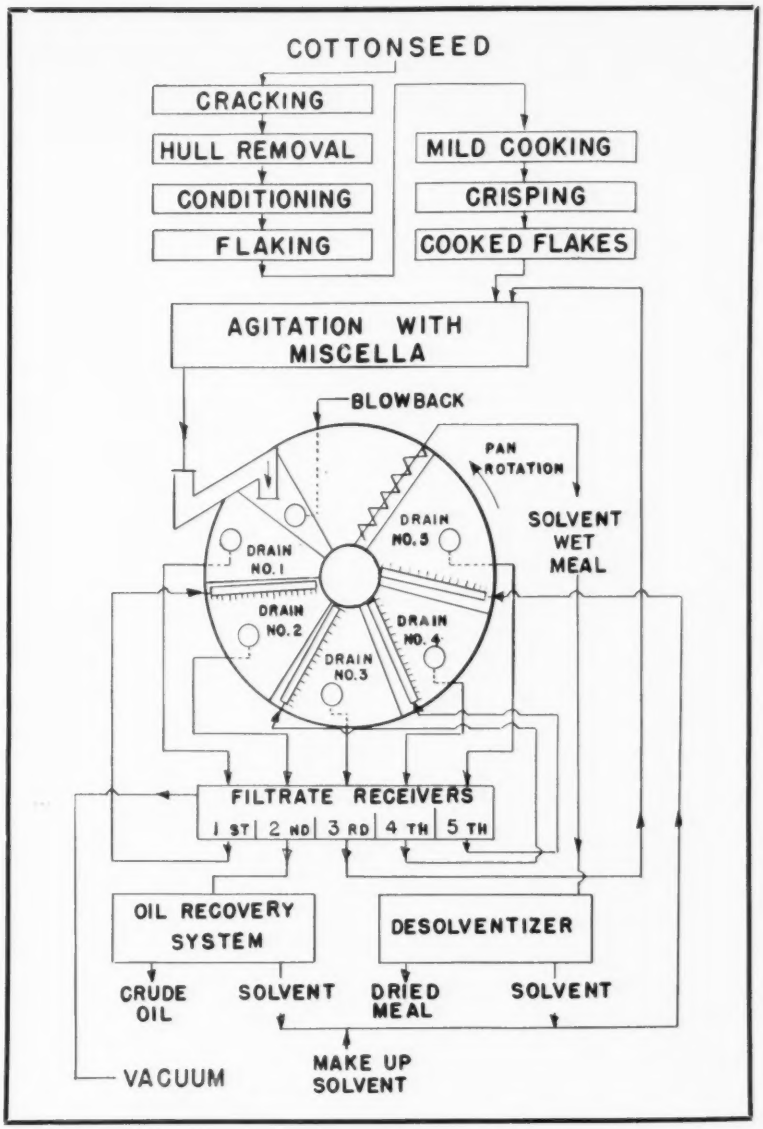

Figure 1. Flow diagram for the filtration-extraction process.

4—It reduces the solvent content of extracted and washed marc to very low values (24% to less than 30%).

In addition, the filter is continuous and automatic in operation. The slurry feed may be flowed on to the filter and an even distribution is aided by the blowback. The blowback clears the screen of meal particles once each revolution. A 60 x 60 mesh square weave stainless steel screen has been found satisfactory. Five filtrates should be satisfactory for most oilseeds—two for final miscella, to provide for refiltration, and three for the countercurrent washes. In addition, a cone-bottomed settling tank provides for the continuous removal of practically all of the fines from the refiltered final miscella. No polishing filter is necessary. Calculations for filter size must be made for both solids and liquids to be handled, and for the mass velocity characteristics of the material. The vacuum required is about 4 to 10 inches of mercury.

Other Operations

The operations of oil and solvent recovery and of meal desolventization follow conventional methods and there is no need to include details here.

Other Oilseeds

A plant is now under construction in Chile for the extraction of rice bran and sunflower seed by the filtration-extraction process. This plant was designed by Wurster and Sanger, Inc.[3], which firm has recently acquired the design information of the Lukens Steel Co. A great deal of development work has been carried out on the application of the filtration-

extraction process to other oleaginous materials at the Southern Utilization Research Branch. In addition to cottonseed (2, 4, 5) and soybeans (1, 8), these include rice bran (9), flaxseed (12), peanuts (13), sesame seed (11), milo germ, and castor beans. All of these have been studied with the bench-scale procedure (10) and cottonseed, soybeans, flaxseed, rice bran, and milo germ have been handled on the continuous, filtration-extraction pilot plant. Bench-scale operations and continuous pilot plant scale operations have been correlated with full scale commercial operations and it is possible to translate data reliably from one scale to the other.

Advantages of the Process

1—Extraction to a residual oil content of 1% or less.

2—Final miscella is refiltered on the continuous filter and has a low fines content. This refiltration followed by continuous settling completely eliminates polishing filters.

3—Preparation steps involve the usual type of rolling and cooking equipment and are conducive to products of high quality. Oil quality for cottonseed is uniformly high even with exhaustive extraction.

4—Solvent content of marc is exceptionally low.

5—Oil content of final miscella is high.

6—Items 4 and 5 result in low solvent requirements and are reflected in higher capacity of recovery equipment and lower steam costs.

7—Solvent losses are low.

8—Minimum time to place process on stream—can change from one oilseed to another "on the run" with a minimum interim mixing of products.

9—Pre-pressing is not required even for high oil content materials.

10—Process is versatile—can handle most oilseeds.

11—The filter is a slow-moving device, and it and its accessories have many self-regulating features; the integrated process requires a minimum of operational attention—one man per shift.

12—High capacity for small filter units.

13—Lower installed cost of plant in comparison with other processes.

14—Power requirements are low.

15—Maintenance costs are low.

RECENT DATA BASED ON COMMERCIAL OPERATIONS

	Cottonseed	Soybeans
Filter diameter	10 feet	10 feet
Daily capacity, tons when processing to residual oil, 1% or less	140-200	80-130
Hulling	Use bar hullers Control at 41% protein	Use 3-pair-high cracking rolls and aspirate and return ground hulls after extraction.
Conditioning before rolling	4-high 72" conditioner 150° F., 11% H2O	4-high, 85" conditioner 175° F., 11-12% H2O
Rolling equipment	5-high, 60" heavy duty rolls.	2 sets—1-pair-high 20" X 48" flaking rolls.
Flake thickness, inches	.068 to .012	.008 to .012
Cooking equipment	6-high, 85 inch	5-high, 85 inch
Cooking time, minutes	40 to 75	25 to 40
Maximum cooking temperature ° F.	225	225
Maximum cooking H2O, %	18 to 20	12 to 15
Final cooking H2O, %	8.5 to 13.0	8.5 to 13.0
Crisping	Open conveyor plus aspiration	Open conveyor
Moisture after) Optimum crisping, %) Range	9 7 to 11	9 7 to 11
Slurrying time, minutes	30 to 45	30 to 45
Slurrying temperature, ° F.	126 to 135	126 to 135
Slurry consistency, % solids	30 to 35	30 to 35
Filtration time, minutes	1.5 to 3.0	2.0 to 4.5
Number of filtrates	1 drain 1 re-filtration 3 washes	1 drain 1 re-filtration 3 washes
Solvent ratio	1.1 to 1.0	1.2 to 1.0
Final miscella concentration, %	25 to 30	20 to 25
Solvent in marc, %	25 to 30	26 to 35
Moisture in meal, %	9.7 to 11.6	9.5 to 13.0
Residual lipides, %	0.5 to 1.0	0.5 to 1.0
Protein, %	40 to 42	45 to 50
Solvent loss, %	0.62	
K. W. Hr., per ton	18.0	
Steam, per ton, lbs.	400	
Water, per ton, gals.	2300	
Labor per shift, men	1.0	
Average life of screens on filter	10,000 tons	

Acknowledgement

The Southern Utilization Research Branch of the Agricultural Research Service is deeply grateful to the Mississippi Cottonseed Products Co., Lukens Steel Co., Wurster and Sanger, Inc., Dorr-Oliver Co., and to many other individuals and firms whose confidence, technical ability, and advice contributed to the commercial adoption of the filtration-extraction process.

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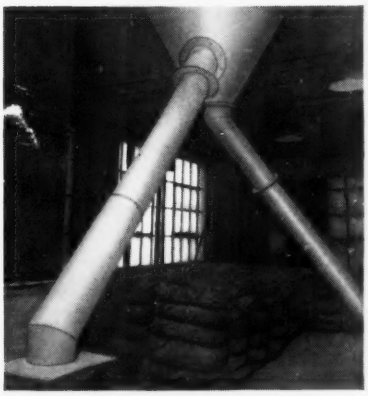
Soybean Dust Problems Solved by Sturtevant Air Separator



RIGHT: Spencer Kellogg & Sons employee making classification adjustment on Sturtevant Air Separator in operation at Bellevue, Ohio, soybean meal plant. Separator minimizes air-borne dust losses while removing hulls and classifying end product.

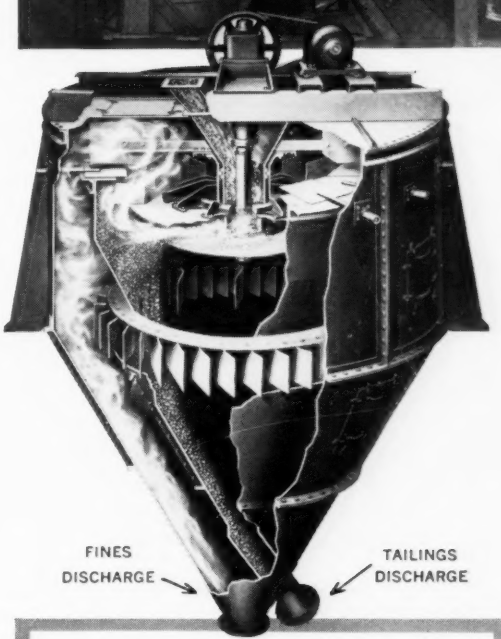
LEFT: Two lead-off chutes at bottom of Sturtevant Air Separator in Spencer Kellogg & Sons plant. One chute in the closed circuit system sends to packaging all uniform size, dust-free meal while the other returns all undersize fines for pelletizing.

Closed Circuit Air Separation Cuts Losses, Keeps Plant Cleaner, Improves End Product

Dust — finer than 80 mesh — was accounting for 4 to 5 percent of the soybean meal production at the Spencer Kellogg & Sons plant in Bellevue, Ohio. Much of this dust was disseminated into the air during processing, becoming a total loss. And such free dust made working conditions unpleasant, plant and storage sheds untidy in appearance. Also, the proportion of dust retained in the end product was an annoyance to farmers and ranchers.

All of these problems have been solved by a Sturtevant Air Separator operating in closed circuit with a pelletizing machine. The processed soybean meal goes through the Air Separator at the rate of about 85 tph. Particles representing dust and hulls go out the fines chute to the pelletizer. The pellets are then ground and re-circulated through the Air Separator at rates to 10 tph, bringing the machine's total capacity to 95 tph.

The net result is that Spencer Kellogg & Sons now has cut dust loss to a minimum, no longer has any air-borne dust problems, and is producing a better standardized, dust-free end product. Sturtevant, the pioneer in centrifugal air separation, has once again helped to solve a precision classification problem — *and without an expensive, multi-unit installation.* Write today for more information. Address: Sturtevant Mill Co., 144 Clayton St., Boston 22, Mass.



THERE'S A STURTEVANT FOR EVERY CAPACITY

No other single air separator can match Sturtevant's 40 to 400 mesh classification range at rates up to 100 tph. . . . and tested record of increasing mill capacities from 25 to 300% while lowering power consumption as much as 50% (when used in closed circuit with grinding mills). Nine models available, ranging from 3 to 18 ft. in diameter. Request Bulletin No. 087.

STURTEVANT

Dry Processing Equipment

The "OPEN-DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

CROP REPORT

1956 Crop Estimate up Again

THE U. S. SOYBEAN crop was estimated at 462 million bushels as of Sept. 1 by the USDA crop reporting board, about 4% above the Aug. 1 forecast. This is nearly a fourth over last year's record of 371 million bushels. The indicated yield of 22 bushels per acre is the highest since 1949.

August and September weather was favorable for soybeans in most of the main soy belt. Drought and hot weather caused severe damage in an area from Nebraska south to Kansas and Oklahoma, then eastward into Arkansas and Mississippi.

In most areas, the crop was not so far advanced as last year but maturity was about average and harvesting was started in most main producing areas by late September.

Reports from Soybean Digest crop reporters:

Illinois. C. G. Simcox, Assumption (9-17): We will have the largest average yield in history, 35 to 45 bushels per acre. We have received 30,000 bushels (at elevator) to date, excellent quality and unusually clean, the cleanest crop we ever had.

Russell S. Davis, Clayton (9-18): Early varieties yield less than 1955. Very few fields of Hawkeye above 30 bushels. USDA estimate too high unless Clark yields are far above average. We have had as near ideal growing season as one could create.

Some Comments on the Crop

Quoting Russell S. Davis, Clayton, Ill.: This is going to be the second year when returns from soybeans are so far below corn that men with high-priced land are considering other crops. The fact that soybeans do not respond to fertilizer is also causing concern when acreage allotments look imminent.

Quoting D. G. Hanway, head, department of agronomy, University of Nebraska, Lincoln: Although yields of soybeans in Nebraska will be low due to drouth, adjacent fields of corn in most cases will yield less, in many cases nothing. This indicates that the crop will tolerate more adverse conditions than corn and still give some yield.

It certainly does not have any stage that is as critical as the tasseling-silking stage on corn when a very few hot days can almost completely destroy the crop. It is more like sorghum in being able to wait through relatively long adverse periods and then respond if rain comes.

Indiana. J. B. Edmondson, Danville (9-25): All combines going. Dry, hot weather stepped up maturity that started late. Weeds greatest problem. Discounts frequent and heavy. Cracking above normal due to fast cylinder speed on account of weeds. Yield widely variant 15 to 45 bushels. Beans are large which affects yield. Moisture no problem, 11-13%. Quality generally good. Some reports of disease—stem canker and bud blight, the latter ruining some fields of heavy weeds and early planting.

Iowa. F. E. Hunt, Adair (9-16): Nearly one-half crop in this locality has been cut for hay on account of drought. Yield should be 20-25 bushels. Beans did not get the usual height on account of hail and wind and dry weather.

Glen Pogeler, North Iowa Cooperative Processing Association, Mason City (9-27): Here it looks like 50% more beans than 1955. Oil content ½% lower than 1955. A fine crop but quite a few weeds and a little dirty. Unless price raises as many beans as can will be put under loan.

Kentucky. David Frymire, Ohio Valley Soybean Cooperative, Henderson (9-18): We have had almost ideal season all year long. Weeds a problem, as always, in river bottom areas. Yields very good. Average will be high. Quality excellent.

Minnesota. Fred Hafner, General Mills, Inc., Minnesota (9-18): Crop maturity about 2 weeks later than last year. Condition very good. Good podding, good filling, fine stands. Bulk of crop will move by Oct. 15 if weather remains favorable. Oil content lower than 1955. Total crop should exceed 55 million bushels in Minnesota.

Howard E. Grow, Farmer Seed & Nursery Co., Faribault (9-25): Fields have ripened evenly and will harvest well. Some volunteer corn in many fields. Quality perfect. Moisture content at present about 11-14%. Yield may be above USDA's Sept. 1 estimate.

Mississippi. W. T. McKinney, Anguilla (9-17): Per acre yield outlook excellent. No report on quality yet. Beans appear to be on average slightly smaller than usual and some only partially filled pods are drying up last few days. No rain since July is responsible for this condition.

SOYBEANS FOR BEANS
September 1956 report, crop reporting board, AMS, USDA

State	Yield per acre: Average 1945-54	Yield per acre: 1955	Yield per acre: Indicated 1956	Production: Average 1945-54	Production: 1955	Production: Indicated 1956
	Bushels	Bushels	Bushels	1,000 bushels	1,000 bushels	1,000 bushels
N. Y.	16.0	16.0	17.0	96	80	85
N. J.	19.1	19.0	24.0	386	684	960
Pa.	16.9	20.0	22.0	400	440	506
Ohio	20.8	24.5	23.5	20,808	29,228	30,574
Ind.	21.6	21.5	25.0	34,809	43,838	54,300
Ill.	22.6	22.5	27.0	83,096	98,325	128,493
Mich.	19.0	22.0	21.5	1,897	3,036	3,870
Wis.	14.0	12.5	15.5	558	975	1,302
Minn.	17.6	19.5	21.0	18,961	43,934	55,776
Iowa	21.3	19.5	21.0	37,202	43,582	55,461
Mo.	17.6	17.5	23.0	20,616	33,950	47,150
N. Dak.	12.2	15.0	15.0	273	1,200	1,995
S. Dak.	15.0	11.5	13.0	971	2,794	3,003
Nebr.	21.1	10.5	10.0	1,297	1,890	1,850
Kans.	11.7	10.0	11.0	3,859	3,350	3,828
Del.	15.0	20.0	23.0	914	2,100	3,105
Md.	16.3	20.0	23.0	1,235	3,100	4,853
Va.	16.6	20.0	22.0	2,250	4,020	5,214
N. C.	15.2	15.5	21.0	4,049	5,068	8,316
S. C.	10.4	14.5	12.0	710	2,740	2,832
Ga.	9.8	12.0	12.0	242	684	780
Fla.	[1]17.8	22.0	20.0	[1]206	792	860
Ky.	17.0	18.0	20.0	1,906	2,412	2,600
Tenn.	17.5	18.0	18.0	2,737	4,500	4,860
Ala.	17.7	23.0	22.0	1,128	2,162	2,090
Miss.	15.0	19.0	14.0	3,907	11,894	10,514
Ark.	16.8	18.0	17.0	8,226	21,906	24,038
La.	15.4	22.0	19.0	618	1,936	2,261
Okla.	10.1	11.5	8.0	354	460	272
Texas	[1]13.5	13.0	20.0	5	26	180
U. S.	20.0	19.9	22.0	253,653	371,106	461,928

[1] Short-time average.

Missouri. Wilbert L. Beauchamp, Elsberry (9-19): Late beans being forced because of dry weather last 4 weeks. Yield outlook about 25 bushels. Green weeds causing some trouble.

Maurice Maze, MFA Cooperative Grain & Feed Co., Mexico (9-19): Very dry weather has speeded up harvest some and has cut expected yields from 5 to 12 bushels per acre. Yields average 22 bushels. Quality fair to good. Moisture low. Additional farm and commercial storage built this year will be ample to hold crop.

E. W. Trachsel, Helena (9-21): High temperatures and lack of rainfall continued to plague northwest Missouri. Conditions are spotted and yields will run from nothing to near normal. Acreage has doubled since last year but some beginners learned that it takes a little know-how to be successful. We had ideal growing conditions to late bloom stage but since then growth has been very slow.

Nebraska. D. G. Hanway, University of Nebraska, Lincoln (9-17): Condition of irrigated crop good, dry land poor. Short beans and low yields due to drouth.

North Carolina. George E. Spain, North Carolina State College, Raleigh (9-18): Moisture has been adequate for most areas all season. Conditions good at present. Harvest will begin latter part of October. Last year only 1 to 2% went under government loan but a good many more are expected to this year.

Ohio. Glen McIlroy, Irwin (9-24): Early beans are dry ready to bin. Where weeds were no problem yields have been higher than usual. Grain men believe few beans will be sold at time of delivery.

South Carolina. Weekly Weather and Crop Bulletin (9-18): Soybean prospects declined as result of worm damage. Shedding became heavy in Calhoun County where moisture supplies have been too low for maximum growth and development.

Tennessee. Tyler Terrett, West Tennessee Soya Mill, Inc., Tiptonville (9-27): Yield per acre will be low—15 bushels a good average. Moisture content fair.

Ontario. Ontario Soya-Bean Growers' Marketing Board, Chatham (9-18): Present crop estimates reveal the crop may about equal last year's 5.5 million bushels. This figure may be drastically reduced if ideal weather conditions do not prevail through harvest.

Reds to Push Exports

COMMUNIST China is expected to be aggressive in the export of agricultural products including soybeans to Japan this coming season, according to reports to the Soybean Digest.

Negotiations for business on new crop Chinese soybeans are expected to commence after October, as was the case last year, in spite of serious flood damage to soybeans and rapeseed, according to our sources.

Rains have flooded Manchurian and mid-Chinese areas and caused a reappraisal of the soybean crop. But as conditions have become better the Peiping government has made it clear it is prepared to compete against U. S. soybeans.

Staley Oil Man Retires

IN 1926 A. E. STALEY, SR., said he "wanted to get into oil refining right."

Now, 30 years later, the chemical engineer he brought to the A. E. Staley Manufacturing Co., at Decatur, Ill., to accomplish that has retired. He is Maurice M. Durkee, oil division superintendent.

The capacity of the Staley refinery when Durkee joined Staley's was slightly more than 200,000 pounds. Now it has a volume of slightly more than 140 times that amount, reports Staley Journal in its account of Mr. Durkee's retirement.

In 1927 the Staley company was just getting well started in soybean processing, only to discover that Americans would have no truck with refined soybean oil. According to Mr. Durkee there were two reasons for this. Most of the soybean oil offered up to then had been the Manchurian variety, which had characteristics not pleasing to the American taste, and no refiners had perfected a method of refining domestic soybean oil of which supplies were small.

In 1928, as he recalls, "with our primitive equipment we produced a batch of fairly refined soybean oil, but the trade would have none of it due to the memory of refined Manchurian.

"Then in the spring of 1931 one or two of our customers took a chance. From then on, and principally by means of the effective batch deodorizer that we developed, the progress was rapid."

This process of refining soybean oil "so that people can eat it," as Mr. Staley put it, Mr. Durkee regards as one of the most important things he has done during his 30 years at Decatur.

The thing which he found most intriguing, he says, also had to do with soybean oil. It was the one known around Staley's as No. 101 oil. In 1929 when margarine manufacturers were taxed for added color to their product, a broker suggested that maybe Staley's could make a soybean oil dark enough that it would color the margarine naturally. In two weeks time the Staley refinery was producing such an oil, which sold for a premium, and met the needs of the customers.

"It was going great guns," Mr. Durkee remembers, "until the Congress changed the law, so that there was a tax on all colored margarine, whether colored artificially or not."

Mr. Durkee was one of the speakers at the first soybean symposium of the American Chemical Society, in the early thirties. In that talk he suggested the cause of the flavor instability of soybean oil, and later saw his theory verified by extensive research at the Northern Regional Laboratory.

M. M. Durkee

He came to Staley's from the Pompeian-Romanza Olive Oil Co. where he had been in charge of operations.

Shortly before his retirement Mr. Durkee was honored at a dinner. Staley division superintendents and others who had worked closely with him were the hosts, and presented him a combination filing cabinet and safe.

David T. Mitchell has been named superintendent of the oil refinery section of the A. E. Staley Manufacturing Co., Decatur, Ill.

David T. Mitchell

Mitchell, who has been with the Staley Co. for 18 years, succeeds Maurice M. Durkee, who has retired.

Until recently Mitchell has been in charge of the Staley monosodium glutamate plant, a position he had held since the plant was started in Decatur in February 1948.

Flax Plantings up

ARGENTINE plantings of flaxseed for the 1956-57 crop are now estimated officially at 2,965,000 acres, an increase of 78% from the 1,662,240 acres planted last year, according to USDA's Foreign Crops and Markets.

A crop of at least 25 million bushels normally could be expected from this acreage, compared with 9.1 million bushels from the 1955-56 crop.

Prospects of a crop of this volume are reportedly raising the question of possible resumption of exports of flaxseed as seed.

Dannen Addition Nears Completion

WORKMEN were hurrying to complete this 1.5-million-bushel addition to the Dannen Mills terminal elevator at St. Joseph, Mo., when this picture was taken. The addition at the right was expected to be ready to accommodate the soybean receipts by October. The addition was built by Roberts Construction Co., Sabetha, Kans.

Discuss Moisture Premiums in Ontario

THE NEGOTIATING committee representing processors, dealers and growers met Sept. 6 in Chatham, Ontario, for the purpose of arriving at an agreement for marketing of the Ontario 1956 soybean crop, the Ontario Soya-Bean Growers' Marketing Board reports.

"Almost the entire negotiating period was taken in discussion of discounts and premiums for moisture content," the Board reports. "The principle of rewarding premium quality with a premium price was agreed upon by the group as a whole and discussions centered around a workable arrangement for payment of such premium.

"It was evident from the discussions that any premium paid for low moisture soybeans would reduce the base price of soybeans and there was no assurance that even as much money would be paid for the crop as a whole as with the present system. The processors repeated their former contention that the price is generally advanced when the average run of the crop is above average quality, particularly when soybeans are being harvested below 14% moisture.

"Grower representatives concluded that the value of soybeans is in the meal and oil and that since lower moisture soybeans contain more oil and meal per ton than high moisture soybeans, the payment of a premium was a realistic selling practice. However, until a practical solution can be found whereby producers will actually benefit in dollars and cents, they felt it was advisable to adhere to the present selling practice."

Strayer on Another Trip to Europe

GEO. M. STRAYER, executive vice president of the American Soybean Association, left Sept. 29 by plane for Hamburg, Germany, on his second trip to Europe this year. He will return to Hudson in three weeks.

G. M. Strayer

Strayer visited nine European countries in June in behalf of export markets for U. S. soybeans and soybean products. This time he will look into possible markets for U.S. fats and oils in the Iron Curtain countries of Poland and Czechoslovakia.

Strayer says considerable quantities of U. S. soybean oil and cottonseed oil are now finding their way indirectly behind the Iron Curtain, but are first being filtered through European countries trading with the Soviet bloc.

Strayer will also contact buyers of hybrid seed corn for Associated Hybrid Producers, of which he is executive secretary. He is accompanied by Charles Wilmarth, Tomahawk Hybrid Corn Co., Belmond, Iowa.

GRITS and FLAKES . . . *from the World of Soy*

New Department

Lyle C. Woods has been named manager of the chemical department of the **A. E. Staley Manufacturing Co.**, Decatur, Ill.

Lyle C. Woods

The position is a newly created one, established to align chemical sales with the development of new products by the Staley Co.'s research division.

In recent years a number of specialties of a chemical nature have been derived from corn and soybeans. These include such products as lecithin, monosodium glutamate, inositol, phytic acid, calcium phytate, modified vegetable oils and industrial soy flour.

The company believes, according to L. S. Roehm, vice president and manager of the company's corn division, that these products along with those expected from an expanded research program will require new and additional training of personnel for proper customer service.

Woods, who has been territory manager for refined oil sales in the Philadelphia territory, took over his new post Oct. 1.

Joins Seedburo

Robert E. Kleinhans has been appointed sales manager of **Seedburo Equipment Co.** of Chicago. This announcement was made by Rex. E. Yocum, president of the firm.

Robert E. Kleinhans

Mr. Kleinhans has wide experience in the testing, grading and handling equipment field and is thoroughly familiar with the problems of grain elevators and allied agricultural trades.

W. J. Klein is appointed vice president and director of sales, and W. L. Voegeli is appointed general sales manager, Tractor Group, **Allis-Chalmers Mfg. Co.**, Milwaukee, Wis

Soybean Maps

The industrial development department of the **Nickel Plate Road**, Cleveland, Ohio, recently issued county production maps for 1955 for Illinois, Indiana and Ohio. Planted and harvested acreage and 1955 yield are shown. Location of processing plants is also shown. Copies are available by writing to the Road.

The 11th annual meeting of the Northeastern Weed Control Conference will be held Jan. 10-12, 1957, in New York City at the Sheraton-Mc-Alpin Hotel. Dr. L. L. Danielson, plant physiologist at the Virginia Truck Experiment Station, Norfolk, Va., is president of the Conference this year.

The **V. D. Anderson Co.**, division of International Basic Economy Corp., has announced the appointment of Jesse R. Hamlett and R. R. Haire of the Valley Machinery & Supply Co., 612 N. Main St., Memphis, Tenn., as exclusive sales representatives with a parts warehouse. They will serve oil millers in Mississippi, Arkansas, Louisiana and western Tennessee.

Don C. Hawkins, Jr., has been appointed sales representative for the New York sales office of **Archer-Daniels-Midland Co.** He will represent ADM's soybean and linseed meals, soy specialty proteins and other products in the eastern sales territory.

Luke Heard, Will Kinard and Bill Smith have announced the opening of **Heard-Kinard-Smith, Inc.**, at 3240 Peachtree Rd., Room 210, Atlanta 5, Ga. The company will sell all types of feed ingredients to feed manufacturers including grain and oil meals. All have had years' experience in the feed industry.

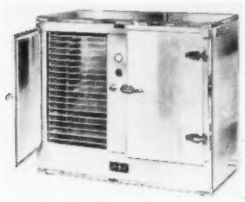
LeRoy Rau has been appointed to handle the sales of the complete line of chemicals of the agricultural chemical division of **Stauffer Chemical Co.'s** Midwest territory. He will make his headquarters at the Omaha office.

Dust Suppression & Engineering Co. has moved its office to 120 South Broadway, Lake Orion, Mich. The engineering staff has been joined by Elbridge M. Smith, who has had 10 years' experience in dust control work. He will function as assistant chief engineer.

Mrs. O. H. Acom, wife of the Missouri director of the American Soybean Association, died Aug. 30 at Wardell, Mo., after a long illness.

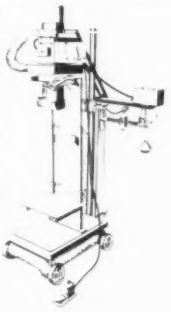
NEW PRODUCTS and SERVICES

GERMINATOR. This newest model Minnesota Style Germinator offered by Seedburo is a water cooled unit designed especially for large seed houses and analytical laboratories who need maintained uniform temperature and accuracy. It has the advantage of the water being circulated through copper tubing built within the walls of the germinator, thus preventing leakage.



For further information write Soybean Digest 10a, Hudson, Iowa.

BAGGING SCALE. Seedburo announces the addition of the Waymatic bagging scale to its present line. This one-man unit provides an economical way to convert any platform scale into a completely automatic bagger-weigher for grain, feed, seed, chemicals or practically any free-flowing dry materials.



The Waymatic can be installed in less than an hour and fills and weighs six to eight bags a minute.

For a free descriptive folder write Soybean Digest 10d, Hudson, Iowa.

SHIELD. Koyker row crop shields will save from 5 to 40% of the crop when harvesting soybeans or other row crops in normal standing fields, according to the manufacturer. Shields will save even more in distress areas.

Koyker shields gently lift up lodged growth—save the beans that lay between rows . . . those lost below the sickle . . . those too low to be gathered by the reel.

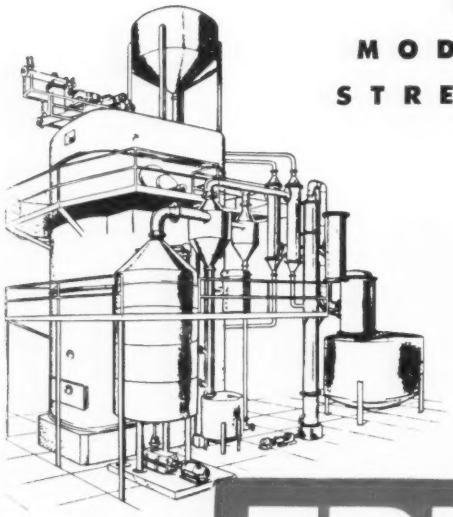
Simple adjustments make Koyker shields easy to attach to any make or model combine, harvester or binder, either pull or mounted type.

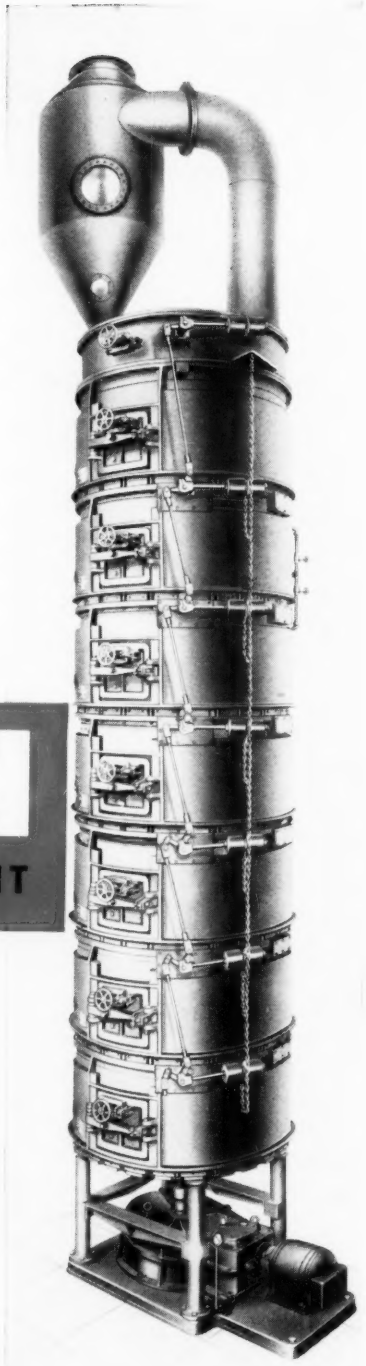
For more information write Soybean Digest 10c, Hudson, Iowa.

follow the trend

EXPAND
MODERNIZE
STREAMLINE

cut operating costs
reduce solvent loss

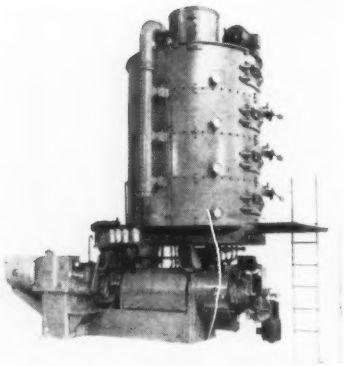




French patented Desolventizer-Toaster.

FRENCH
OIL MILLING EQUIPMENT

French, the world's largest manufacturer of vegetable oil processing equipment, can show you how to cut operating costs . . . increase capacity . . . and improve product quality. Our engineers have made complete studies of many operating plants of all makes—and have shown management how to cut costs and increase capacity . . . all at very low cost. Ask us to make recommendations for boosting the efficiency and profits of your plant. Write to FOMMCO, Extraction Division, Piqua, Ohio.



French Continuous Mechanical Screw Press. Residual oils as low as 2.5%.

F07

THE FRENCH OIL MILL MACHINERY CO.
PIQUA, OHIO—U. S. A.

- MECHANICAL SCREW PRESSES
- COOKER DRYERS
- SOLVENT EXTRACTION PLANTS
- FLAKING AND CRUSHING ROLLS

LATE REPORTS

SUPPLY AND DISTRIBUTION of the 1952-55 soybean crops, reported by Agricultural Marketing Service. (1,000 bu.)

Item	1952-53	1953-54	1954-55	1955-56
Carryover, Oct. 1	3,575	10,137	1,336	9,957
Production	298,839	269,169	341,075	371,106
Total supply [1]	302,414	279,306	342,411	381,063
Farm use, including seed for season	25,967	25,168	25,000	28,000
Quantity remaining for processing, export or carryover	276,447	254,138	317,411	353,063
Disappearance, October through Aug. 31				
Crushed for oil or processed [2]	218,752	202,018	230,298	263,250
Exported	30,778	38,999	56,642	[3] 63,575
Total	249,530	241,017	286,940	326,825
Balance on Sept. 1 for processing, export, or carryover	26,917	13,121	30,471	26,238

[1] Imports negligible. [2] No allowance is made for new crop crushings prior to Oct. 1. [3] Data for August estimated.

EXPORTS of vegetable oils under P. L. 480 program reported by USDA's Foreign Agricultural Service.

Edible vegetable oils included in agreements negotiated under Title I, Public Law 480, since June 30, 1955, and purchase authorizations issued pursuant to these agreements through Sept. 21, 1956.

Country	Agreements [1] Date announced	Agreements [1] Value Mil. dols.	Agreements [1] Approximate quantity [2] Mil. lb.	Purchase authorizations Reference Number	Purchase authorizations Date	Purchase authorizations Value Mil. dols.	Purchase authorizations Approximate quantity [2] Mil. lb.
Argentina	Dec. 21, 1955	24.7	175	14-02	1-5 -56	24.7	157[3]
Chile	Mar. 13, 1956	12.5	79	12-05	6-20-56	4.8	26
Chile				12-06	6-20-56	7.7	42
Colombia	Dec. 21, 1955	1.5	8	25-04	2-15-56	1.5	8[3]
Ecuador	Oct. 7, 1955	1.5	10	29-02	11-4 -55	1.5	10
Greece	Feb. 28, 1956	5.9	31	26-10	3-21-56	5.9	31
Greece	Aug. 8, 1956	5.8	33	26-16	9-12-56	5.8	35
Iran	Feb. 20, 1956	1.4	7	32-04	5-14-56	1.5	6
Israel	Nov. 16, 1955	2.2	13	16-17	1-31-56	2.2	13[3]
Italy	Feb. 15, 1956	4.5	32	20-06	2-15-56	4.5	26[3]
Italy	July 6, 1956	5.5	33	20-07	7-26-56	5.5	34
Korea	Mar. 13, 1956	3.0	16	24-11	9-6 -56	1.5	10
Pakistan [4]	Sept. 7, 1956	2.4	15				
Paraguay	May 2, 1956	.3	2	36-03	6-18-56	.3	2
Peru	Sept. 22, 1955	3.0	22	13-02	11-1 -55	1.2	8[3]
Spain	Oct. 24, 1955	10.0	66	17-06	10-25-55	10.0	64[3]
Spain	Jan. 24, 1956	15.0	100	17-07	1-31-56	15.0	82[3]
Spain	Mar. 5, 1956	25.0	124	17-10	3-29-56	15.0	75[3]
Spain				17-18	6-22-56	10.0	55
Spain [5]	Sept. 17, 1956	7.0	41	17-23	9-19-56	7.0	41
Turkey	Mar. 13, 1956	3.7	22	10-11	6-25-56	3.8	21
Totals		134.9	829			129.4	746

[1] Including amendments to the original agreements. [2] Estimated from market prices prevailing when the agreement was announced or the P. A. was issued. [3] Actual shipments; program completed. [4] Amendment to original agreement of Aug. 7, 1956, which did not include edible oils. [5] Amendment to agreement of Mar. 5, 1956.

PROCESSING OPERATIONS. Reported by Bureau of the Census for July and August.

Primary products except crude oil at crude oil mill locations: Production, shipments and transfers, and stocks, August 1956-July 1956 (tons)

	Production		Shipments and transfers		Stocks end of month	
	August	July	August	July	Aug. 31,	July 31,
Soybean:						
Cake and meal	513,028	475,294	549,898	510,582	145,788	182,658
Flour	8,903	7,192	8,790	7,256	1,771	1,658
Lecithin	1,419	1,141	(NA)	(NA)	1,365	1,302

(NA)—Not available.

Soybeans: Net receipts, crushings, and stocks at oil mills, by states, August 1956-July 1956 (tons)

	Net receipts at mills		Crushed or used		Stocks at mills	
	August	July	August	July	Aug. 31,	July 31,
U. S.	230,781	305,618	653,796	611,338	370,790	793,805
Illinois	86,528	119,410	244,478	248,832	150,033	307,983
Indiana	21,221	56,114	80,008	46,409	36,610	95,397
Iowa	42,314	51,676	105,935	107,883	55,441	119,062
Kansas	423	(1)	(1)	(1)	79	(1)
Kentucky	3,578	4,717	(1)	10,203	(1)	21,717
Minnesota	35,199	25,393	49,245	44,776	19,886	33,932
Missouri	928	2,591	25,259	12,980	20,459	44,790
Nebraska	(1)	(1)	.....	.....	(1)	(1)
North Carolina	(1)	(1)	.....	.....	288	(1)
Ohio	27,707	41,057	69,081	68,740	56,808	98,182
Texas	.....	(1)	.....	.....	(1)	(1)
All other	12,883	4,660	79,790	71,515	31,186	72,742

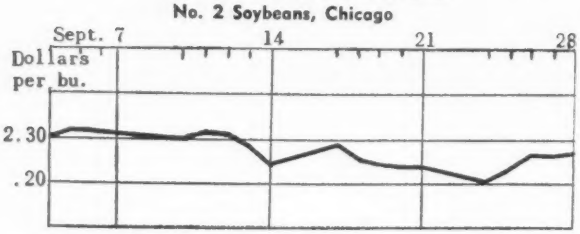
Soybean products: Production and stocks at oil mill locations, by states, August 1956-July 1956

	Crude oil (thousands of pounds) Production		Stocks at mills		Cake and meal (tons) Production		Stocks at mills	
	August 1956	July 1956	August 31, 1956	July 31, 1956	August 1956	July 1956	August 31, 1956	July 31, 1956
U. S.	249,027	228,348	87,281	98,575	513,028	475,294	145,788	182,658
Illinois	93,714	94,919	35,609	35,291	182,980	186,148	54,400	60,056
Indiana	31,396	17,802	10,070	13,762	65,167	38,033	40,635	50,273
Iowa	40,710	40,496	11,142	14,853	85,907	87,419	23,301	29,288
Kansas	(1)	(5)	(1)	(1)	(1)	(1)	(1)	(1)
Kentucky	(1)	3,664	(1)	(1)	(1)	7,815	(1)	705
Minnesota	17,983	16,177	7,894	3,861	38,013	35,164	1,729	1,088
Missouri	9,141	4,318	1,870	4,965	19,982	9,143	3,628	2,804
Nebraska	.....	.....	(1)	(1)	.....	.....	(1)	(1)
N. Carolina	.....	.....	(1)	(1)	56,021	54,852	3,854	5,196
Ohio	25,917	25,428	5,335	6,648	.....	.....	1,854	3,610
All other	30,166	25,545	15,361	19,195	64,958	56,720	16,387	29,638

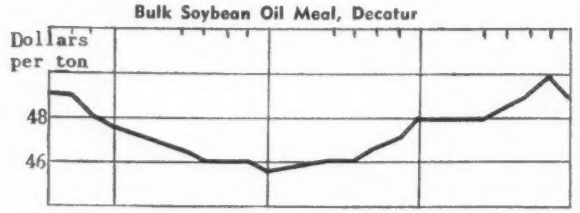
[1] Included in "All other" to avoid disclosure of figures for individual companies.

DAILY MARKET PRICES

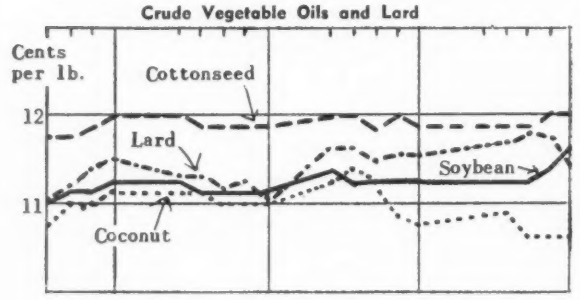
No. 2 Soybeans, Chicago



Bulk Soybean Oil Meal, Decatur

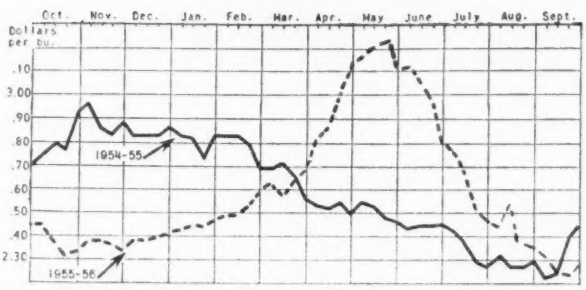


Crude Vegetable Oils and Lard

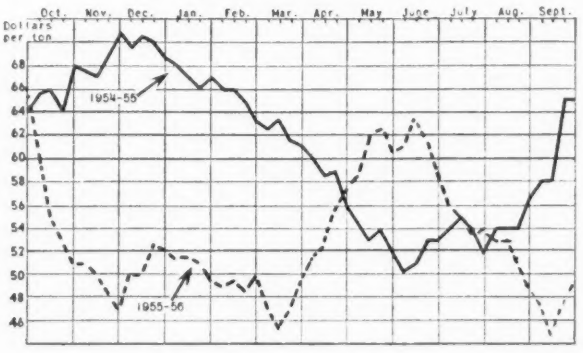


TRENDS AT A GLANCE (Weekly Close)

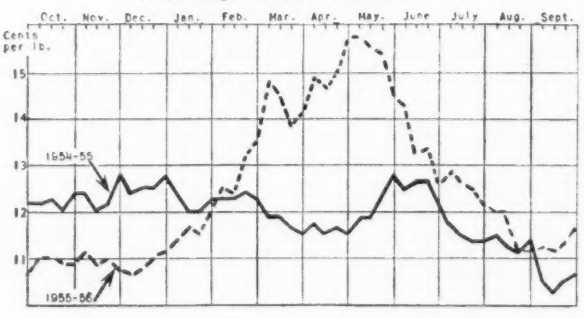
Near Futures Soybeans, Chicago



Bulk Soybean Oil Meal, Decatur



Crude Soybean Oil, Tankcars



September Markets

MARKETS moved in a narrow range during September awaiting the outturn of the new soybean crop, with the price of soybeans holding close to the support level.

Prices were expected to "drift" until the heavy crop movement was underway. They were sensitive to any weather news that might speed or delay harvest and to any pre-election move the government might make to bolster prices or boost exports. There was little net change in any market, however. Meal broke $3.50 during September but regained most of the ground lost.

A huge prospective soybean crop—about 90 million bushels more than any previous crop, according to USDA's Sept. 1 estimate—was balanced by the apparent determination of producers to hold the crop off the market.

Bullish factors:

1—Reports that Japan will again buy large amounts of soybeans.

2—Expected early heavy exports of soybean oil.

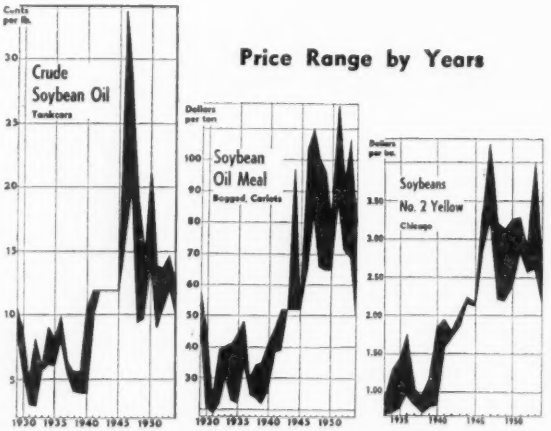
3—The belief that prices are low enough to attract a good export demand.

4—Rumors circulating in the trade that the government may take steps to strengthen the market, such as putting beans under P. L. 480 or a buying program for soybean oil.

Bearish influences included reports that processors have been fairly well fixed for supplies for immediate needs and that meal buyers have been marking time awaiting the heavy crop movement.

BYPRODUCTS. The price of soybean fatty acids remained at 15¼¢ per pound during September. Acid soybean soap stock delivered Midwest declined from 5½¢ to 5¼¢, and raw soybean soap stock from 2⅝¢ to 2¼¢.

Price Range by Years



WASHINGTON DIGEST

See $2 Bottom Bean Price

By WAYNE DARROW
Washington Correspondent for
The Soybean Digest

BEAN PRICES. USDA expects soybean prices to fluctuate during harvest around the support level of $2.15 a bushel, national farm average, with a low of about $2. Most officials say they doubt beans will go below $2 this fall. Many outside observers think this view is too optimistic—expect beans to go lower than that.

Not much of a spring price rise is expected by USDA: about 5¢ above the loan. It's figured that loan plus interest will pull beans out of the loan. Interest is about ½¢ a bushel per month.

The Suez Canal crisis could materially affect European demand for U. S. oilseeds and oils, USDA says. Large quantities of oilseed, copra and oils normally move northward through the Canal from India, China, the Philippines and other Far Eastern areas. If their movement is retarded or if transportation cost increased, the U. S. competitive position would be strengthened.

EXPORTS. September-December shipments of edible oils in the 480 export program will be in excess of those of that period last year. As of Sept. 1, USDA reports that about 240 million pounds were still to be exported under agreements made prior to that date. To this is added about 82 million pounds to Spain, Greece and Pakistan on authorizations extended since Sept. 1, and some from several new agreements being negotiated.

USDA expects larger exports of beans in the 1956-57 season than the 67 million bushels for the year ending Sept. 30. The estimate is based on larger supplies at lower prices.

Bean prices later in the new marketing year may be affected by the size of foreign crops, for which reasonably reliable estimates won't be available for 2 or 3 months. Among the competitive crops are Mediterranean olive oil, African peanuts, and Indian and Chinese soybeans.

Soybean oil prices the next few months are expected by USDA to continue somewhat above the comparable period a year ago. They were steady at 11¢ a pound, crude, Midwest mills, during Oct.-Dec. 1955.

USDA estimated a take-over of 22 million bushels of beans from the 1956 crop in its report to Congress Aug. 27 on the status of CCC surpluses and surplus disposal, as required by the 1956 Farm Act. USDA estimated dollar sales of 11 million bushels domestic and 1 million bushels in export, leaving 10 million bushels of CCC stocks next June 30.

OIL PROGRAM. There will be no soybean oil buying program this fall, USDA officials said flatly after a meeting with industry men recently. One official said the matter was barely mentioned in the meeting, despite strong trade rumors of a 12¢ floor under oil. Undersecretary Morse emphasized that export prospects are good, and that farmers should engage in orderly marketing by storing beans in the loan program.

Total supply of food fats and oils in the marketing year beginning Oct. 1 will be about as large as in 1955-56, USDA estimates. The quantity available for export will permit exports equal to the record 2.7 billion pounds for the year now ending, and leave stocks a year from now about the same as now.

Demand for soybean meal is expected to be less the coming year. USDA estimates that 7 or 8% fewer hogs will be fed. Demand for poultry feed will at most rise only moderately from the high 1955-56 level. Last year exports of meal rose to a new high. They're expected to stay at a relatively high level the coming year. USDA is more bearish on meal prices than on prices of beans and oil.

Sorry We Slipped!

IN THE SEPTEMBER issue of Soybean Digest, we inadvertently inserted the wrong ad for A. E. Staley Manufacturing Co., Decatur, Ill.

The ad which appeared was for a product no longer manufactured by the Staley Co. Please accept our sincerest apologies for any inconvenience that may arise from this slip-up.

New Minnesota Plant

Construction began in August on a $200,000 soybean processing plant at Halstad, Minn., by Halstad Elevator Co., a cooperative, according to the Minneapolis Tribune.

The plant will have a capacity of from 400,000 to 500,000 bushels of soybeans a year. O. E. Bervig, manager, said plans are to complete the plant by late November.

At N. C. Grain Dealer Meeting

ATTENDING the summer business meeting of the North Carolina Grain Dealers Association at Nags Head recently (left to right): Roy E. Folck, Jr., Continental Grain Co., Norfolk, Va.; Sam Sabin, Continental Grain Co., Washington, D. C.; D. T. Whitehurst, Elizabeth City; and D. A. Rouse, Latham Seed Co., Balhaven, N. C.

Morse Urges Storage Program by Farmers

ACTING Secretary of Agriculture True D. Morse has urged farmers to protect their interest in this year's abundant crop production by marketing soybeans and other crops in an orderly way, avoiding undue price-depressing influences at harvest time.

"The price support programs can be used very effectively to assist in orderly marketing," said Morse. "The government stands ready to make prompt loans on many leading crops. Through use of these price-support loans, farmers can finance holding operations, keeping ownership of their crops and spreading marketing out over the more favorable periods of the year.

"Soybeans are a good example of a crop for which this self-help in orderly marketing can be particularly effective.

"A record crop of 462 million bushels of soybeans has been estimated. This year's national average support price is $2.15 a bushel. By taking out the non-recourse loans at this average level, farmers will be in position to postpone part of their marketing. They will be able to avoid excess marketings that could result at harvest time, and can take advantage of any benefits from paying off the loans and selling later in the year when markets are better.

"Also, in reference to soybeans, it should be noted that during the 1955-56 marketing season U. S. exports of cottonseed and soybean oils reached a record level of well over 1 billion pounds. In addition, soybean exports probably will exceed 65 million bushels. World demand for U. S. edible fats, oils and soybeans during the 1956-57 season will remain at a high level. Full advantage of this strong demand is being taken through vigorous promotion of export sales. Large exports of soybeans, edible oils and lard are expected through normal trade for dollars. Additional large quantities of edible oils and lard are expected to be exported under Public Law 480 and foreign aid authorities.

"Storage is important in orderly marketing. As we have frequently suggested in recent months, more farmers should take steps to insure adequate storage. Where additional on-farm space is needed, special government programs of financial assistance are available to help producers buy or build what they need.

"I cannot urge too strongly the need to make all necessary plans now to prepare for orderly, well-managed marketings."

Market Street

We invite the readers of THE SOYBEAN DIGEST to use MARKET STREET for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate 10c per word per issue. Minimum insertion $2.00.

WANTED: FLAKING AND CRACKing rolls, meal coolers and driers and rollermills. Soybean Digest, Box 319-J, Hudson, Iowa.

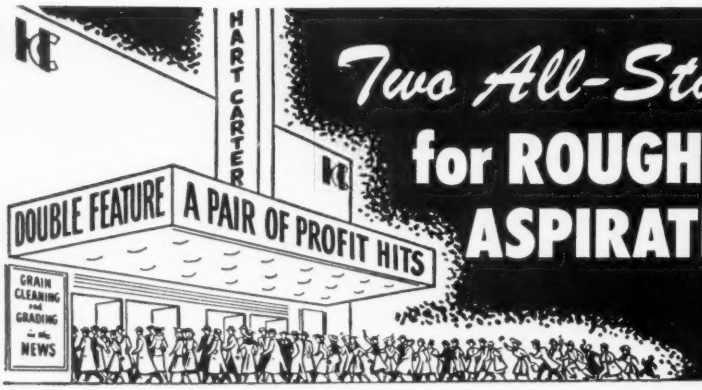
FOR SALE — USED CLIPPER cleaner — Model 49DBB, 25 screens. Graymont Cooperative Assn., Graymont, Ill.

WANTED — 2 ANDERSON DUO-Expellers and bean driers. Communicate with Barvin Packing Co., Box 21027, Houston 26, Tex.

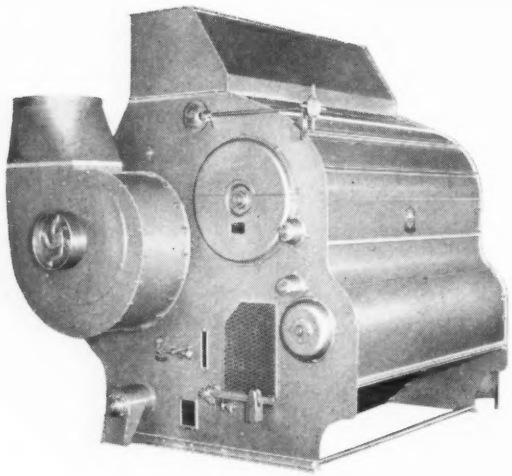
FOR SALE—NEW AND USED feed mill equipment of all kinds, also used electric motors, starters. M. J. Benson Co., RFD No. 1, Box 377, Hopkins, Minn.

FOR SALE — RICHARDSON AND Fairbanks scales, Niagara vibrating screen, Buckeye engine, Titusville boiler, meal coolers, condensers, Roots-Connersville blowers, heat exchangers, hammer mills, Eureka dust collectors, pumps, valves, electric motors and electrical starting equipment, A-1 condition. Contact Lee Atherton, Archer-Daniels-Midland Co., Investors Bldg., Minneapolis, Minn.

NEW AND USED PORTABLE FEED mills. H. L. Myers, Route 3, Alliance, Ohio. Phone 7044.

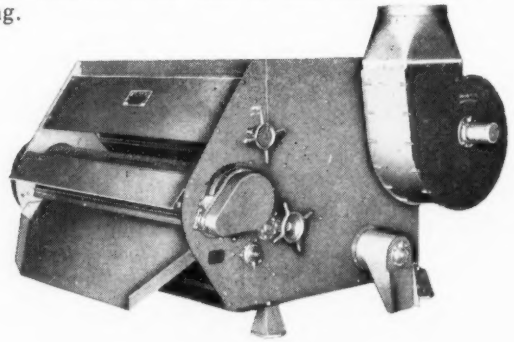


Two All-Star Performers for ROUGH SCALPING and ASPIRATING SOYBEANS and GRAINS



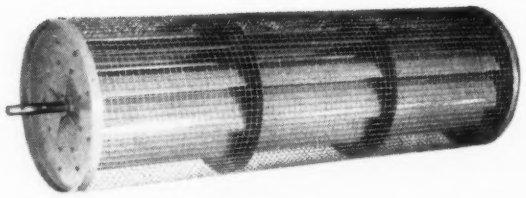
24" x 76" CARTER SCALPERATOR

On soybeans going directly to storage the Carter Scalperator does a good job of both rough scalping and aspirating. It removes both coarse and light foreign materials. The Scalperator also is used on beans or grains when they're turned for cooling. Note that this machine can be used on other grains without change of equipment. The 24" x 76" Scalperator is 84" wide, 117" long, and 96" high. The 24" x 60" size of this model is 101" long.



11" x 60" CARTER SCALPERATOR

The 11" x 60" Scalperator is ideal for smaller runs. The 11" x 60" is 79" wide, 89" long, and 48" high . . . fits neatly into work space. The 11" x 42" size of this model is 71" long. All Scalperators are rotary in motion, thus operate without vibration.



THE BASIC UNIT—*Hart-Carter "Squirrel Cage" Scalping Reel. Baffle plate construction retards flow of beans through the reel, insuring thorough rough scalping. The reel is self-cleaning.*

For details, write to:

HART-CARTER COMPANY

689 19th Avenue N.E. Minneapolis 18, Minnesota

The CARTER SCALPERATOR

IN THE MARKETS

EXPORTS OIL, MEAL. July exports of cottonseed oil and of all oil cakes and meal from the United States were down to two-thirds and one-half, respectively, of the July 1955 figures, according to preliminary estimates of the Foreign Agricultural Service. Exports of soybean oil, while still nearly 10 times the July 1955 figure, have leveled off somewhat from the previous months' level. These estimates are based on adjusted preliminary Census Bureau data.

Exports of cottonseed oil for the first 7 months of 1956 were just 13% above January-July 1955, but soybean oil exports continued to be nearly 13 times the previous year's cumulative total. Exports of cake and meal in January-July were 40% greater than last year.

Cottonseed oil, soybean oil, oilcakes and meals: Preliminary estimates of U. S. exports in July and January-July, 1956, and actual exports, July and January-July, 1955

Commodity	1955 July	1955 Jan.-July	1956 July	1956 Jan.-July
		(Actual)		(Estimated)
	Million pounds			
Cottonseed oil, refined	34.4	238.6	35.9	200.7
Cottonseed oil, refined and further processed	23.6	68.9	5.6	92.0
Cottonseed oil, crude	17.1	66.5	9.0	130.0
Total cottonseed oil	75.1	374.0	50.5	422.7
Soybean oil, refined	1.3	12.3	1.7	41.8
Soybean oil, refined and further processed	4.4	9.5	39.7	220.8
Soybean oil, crude	0.4	2.9	17.4	51.7
Total soybean oil	6.1	24.7	58.8	314.3
	Thousand short tons			
Cottonseed cake and meal	19.3	77.6	1.2	34.0
Linseed cake and meal	5.9	18.9	9.4	59.9
Soybean cake and meal	30.3	111.0	19.5	196.7
Total cake and meal[1]	55.5	207.5	30.1	290.6

[1] Excluding peanut cake and meal, exports of which have been negligible since 1952.

EXPORTS. U. S. exports of soybeans and soybean oil for July. Preliminary data by Foreign Agricultural Service, U. S. Department of Agriculture.

Soybeans	3,708,798 bu.
Soybean oil:	
Crude	17,624,304 lbs.
Refined, but not further processed	1,895,835 lbs.
Refined, deodorized and hydrogenated	38,300,455 lbs.

Converted to a soybean equivalent basis the exports for July amounted to 9,194,442 bushels.

Soybeans: Inspections for overseas export by ports and country of destination Aug. 20-Sept. 14. Reported by Agricultural Marketing Service. (1,000 bu.)

	Baltimore	Norfolk	New Orleans	Mobile	Total
Holland	89,699	56,000	93,333		239,032
Germany			111,999		111,999
Belgium		18,666	513,333		531,999
Formosa				349,081	349,081
Japan			833		833
Norway		37,333	39,200		76,533
Korea			127,660		127,660
Total	89,699	111,999	886,358	349,081	1,437,137

Total exports and inspections for export Oct. 1-Sept. 14, 63.5 million bushels compared with 58.1 million bushels for the same period a year ago.

MEAL SUPPLY. Based on present indications, a further increase in the total supply of oilseed cake and meal is in prospect for the 1956-57 feeding year over the high level reached in 1955-56, according to Agricultural Marketing Service, USDA. The record soybean crop is expected to result in a record crush of soybeans during the coming year which could boost soybean meal production by around a million tons over the 1955-56 output, currently estimated at nearly 6½ million tons.

The production of cottonseed cake and meal may be a little smaller than the 2.6 million tons now estimated for the 1955-56 feeding year, but any reduction would be expected only to offset a part of the increase in prospect for soybean meal. Supplies of other oil cake and meal are not expected to change materially from the 1955-56 levels.

The tonnage of oilseed meal fed to livestock during the 1955-56 season is now expected to total about 9.1 million tons, 600,000 tons more than last year.

Oilseed meal: Supply and disappearance, United States, average 1949-53, annual 1951-55. (1,000 tons)

Year Beginning October	Supply: Stocks Oct. 1[1]	Supply: Production	Supply: Imports	Supply: Total	Disappearance: Livestock feed	Disappearance: Other uses	Disappearance: Exports	Disappearance: Total
Average								
1949-53	189	8,665	244	9,098	8,651	61	166	8,878
1951	136	8,940	358	9,434	9,130	60	86	9,276
1952	158	8,848	304	9,310	8,918	60	102	9,080
1953	230[3]	8,821	168	9,219	8,677	60	168	8,905
1954	314	8,901	95	9,310	8,519	60	517	9,096
1955[4]	214	9,850	100	10,164	9,144	60	700	9,900

[1] Stocks at processors' plants. [2] Estimated quantities of soybean meal used for industrial purposes and cottonseed meal used for fertilizer on farms of cotton growers. [3] Includes 29,000 thousand tons of cottonseed meal owned by CCC and not stored at processors' plants. [4] Preliminary estimates.

STOCKS. Agricultural Marketing Service's commercial grain stocks reports for close of business on Friday and Saturday preceding date of report (1,000 bu.)

	Aug. 28	Sept. 4	Sept. 11	Sept. 18	Sept. 25
U. S. soybeans in store and afloat at domestic markets					
Atlantic Coast	198	155	120	100	64
Gulf Coast	700	245	146	146	503
Northwestern and Upper Lake	27	5	4	4	6
Lower Lake	2,036	1,507	1,089	751	1,219
East Central	103	105	197	434	763
West Central, Southwestern & Western	63	39	36	29	56
Total current week	3,127	2,056	1,592	1,464	2,611
Total year ago	1,996	1,399	1,053	1,645	3,007
U. S. soybeans in store and afloat at Canadian markets					
Total current week	115	194	183	166	95
Total year ago	0	0	0	0	0
Total North American commercial soybean stocks					
Current week	3,242	2,056	1,775	1,630	2,706
Year ago	1,996	1,399	1,053	1,645	3,007

Primary receipts (1,000 bu.) of soybeans at important interior points for week ending:

	Aug. 24	Aug. 31	Sept. 7	Sept. 14	Sept. 21
Chicago	5	28	33	384	895
Indianapolis	30	60	76	282	477
Kansas City	4		2	44	373
Minneapolis	19	55	18	2	6
Omaha		2			
Peoria	11	13	16	36	77
Sioux City	7	6	4	8	
St. Joseph		2	9	14	165
St. Louis	1		16	74	169
Toledo	19	22	18	27	85
Totals	96	188	192	871	2,247
Last year	1,205	878	769	1,269	2,674
Total Chicago soybean stocks	2,036	1,470	1,089	749	1,216

FACTORY USE VEGETABLE OILS for June and July. Reported by Bureau of the Census (1,000 lbs.)

	Factory production		Factory consumption		Factory and warehouse stocks	
	July 1956	June 1956	July 1956	June 1956	July 31, 1956	June 30, 1956
Cottonseed, crude	43,472	54,412	37,083	78,810	40,375	38,162
Cottonseed, r'f'nd	34,607	73,667	84,298	*105,688	243,791	*328,051
Peanut, crude[1]	10,215	10,182	6,978	6,833	20,968	19,089
Peanut, refined	6,615	6,561	3,657	3,438	10,947	9,685
Corn, crude	21,527	22,031	19,154	21,932	17,467	14,823
Corn, refined	17,728	20,269	17,745	20,388	7,204	7,179
Soybean, crude	228,348	248,636	215,835	222,786	174,970	179,630
Soybean, refined	193,610	205,257	196,948	*211,447	112,828	*116,853

* Revised. [1] Data on production and stocks at crude oil mill locations collected by Agricultural Marketing Service, U. S. Department of Agriculture.

Consumption of fats and oils in fat splitting

	1956			1955	
	July	June	Jan.-July Cumulative	July	Jan.-July Cumulative
Soapstocks					
Vegetable foots	5,515	7,577	60,237	7,552	66,372

Source: U. S. Census Bureau.

Factory consumption of vegetable fats and oils, by uses, during July 1956

	Edible products			Inedible products			
	Shortening	Margarine	Other edible	Soap	Paint and varnish	Lubricants and similar oils[1]	Other inedible[2]
Cottonseed, refined	5,834	893	3,152				200
Soybean, crude				30	490		1,594
Soybean, refined	21,372	4,101	4,181		6,383	23	5,950
Foots, vegetable, raw and acidulated (100% basis)				2,013	117	525	664
Hydrogenated vegetable oils, edible:							
Cottonseed	8,829	13,093					
Soybean	20,233	42,506	1,259				
Other	2,070		1,040				

[1] Includes quantities consumed in lubricants, greases, cutting oils, core oils, brake fluids, and metal working. [2] Includes quantities consumed in chemicals, linoleum, oilcloth and animal feeds.

INSPECTIONS. Soybeans, inspected receipts by grades and percent, as reported by Agricultural Marketing Service.[1]

Grade	Oct.-Aug. 1954-55		Oct.-Aug. 1955-56		August 1955		July 1956		August 1956[2]	
	1,000 bu.	Pct.	1,000 bu.	Pct.	1,000 bu.	Pct.	1,000 bu.	Pct.	1,000 bu.	Pct.
No. 1	50,959	21	56,334	21	6,447	35	1,673	18	684	18
No. 2	128,688	52	129,931	49	9,722	53	4,746	51	1,870	51
No. 3	47,979	19	53,792	20	1,332	7	1,910	20	708	19
No. 4	13,615	5	19,642	8	496	3	659	7	273	8
Sample	6,895	3	6,105	2	452	2	364	4	155	4
Total	248,136	100	265,804	100	18,449	100	9,352	100	3,700	100

[1] Carlot receipts have been converted to bushels on the basis that 1 carlot equals 1,750 bushels. [2] Of the August 1956 receipts, 2,150 bushels were black, 5,250 mixed, 1,750 brown, and the remainder yellow soybeans. Inspections of soybeans in August included 676,305 bushels as cargo lots, 244,327 bushels as truck receipts, and the balance as carlot receipts. Based on reports of inspections by licensed grain inspectors by licensed grain inspectors at all markets.

PRICES. Average prices for soybeans received by farmers, effective parity, and support rates (dollars per bushel)

Average farm price			Effective parity	Av. price as percent of parity	National average price support rate		
Aug. 15 1955	July 15 1956	Aug. 15 1956	Aug. 15 1956	Aug. 15 1956	1954 crop	1955 crop	1956 crop
2.20	2.47	2.33	2.94	79	2.22	2.04	2.15

Average farm and parity prices from crop reporting board.

Average monthly price No. 2 yellow soybeans, at Illinois country shipping points, 1951 to date. Reported by Agricultural Marketing Service. (dollars)

Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Avg.
1951-52	2.80	2.90	2.95	2.90	2.90	2.88	2.82	2.92	3.17	3.22	3.25	2.98	2.97
1952-53	2.85	2.89	2.90	2.85	2.82	2.94	2.95	2.87	2.76	2.56	2.55	2.47	2.78
1953-54	2.57	2.83	2.99	3.03	3.17	3.49	3.80	3.63	3.66	3.70	3.55	2.72	3.26
1954-55	2.69	2.74	2.73	2.74	2.74	2.63	2.54	2.46	2.42	2.36	2.39	2.24	2.56
1955-56	2.22	2.19	2.27	2.35	2.45	2.56	2.85	3.10	2.97	2.54			

Quotations are for No. 1 yellow soybeans since the latter part of September 1953.

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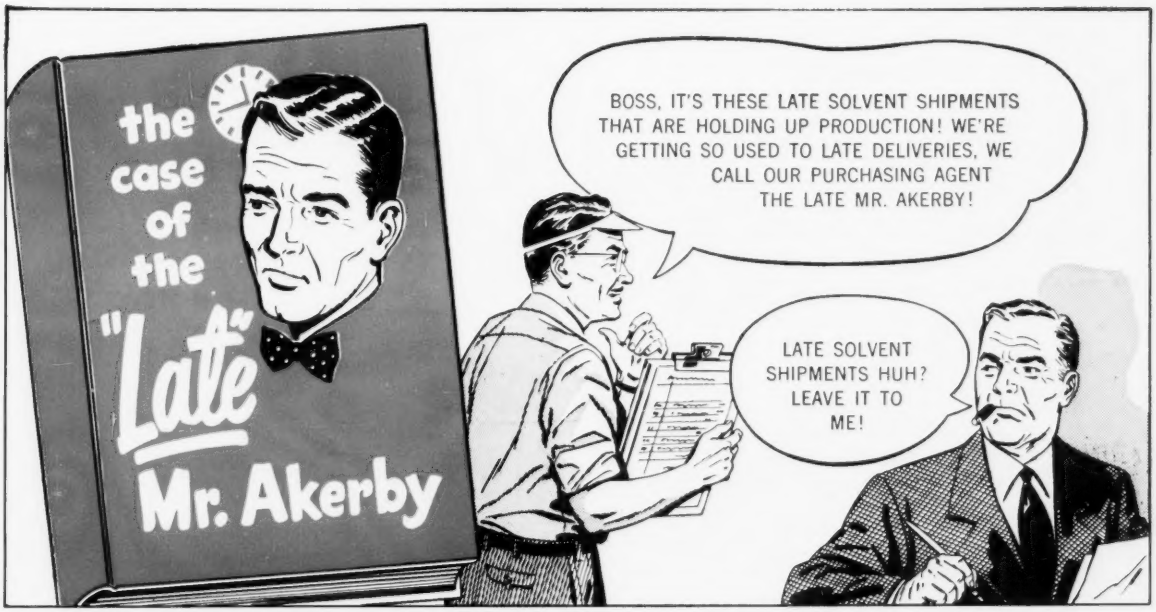

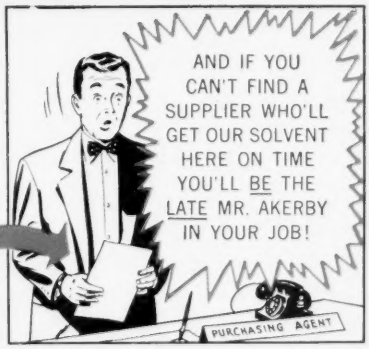

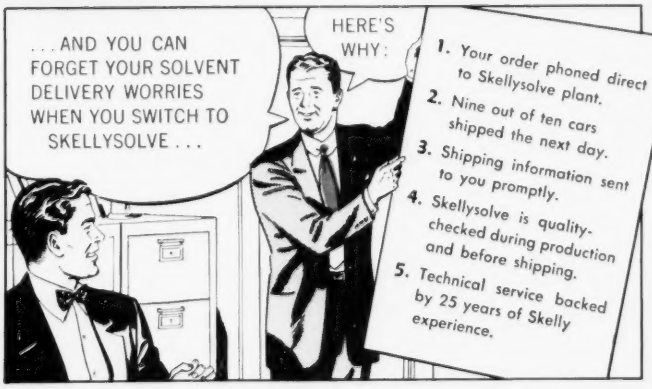

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